

File

FOREST SURVEY MANUAL



U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REVISED APRIL , 1952

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

ADDRESS REPLY TO
CHIEF, FOREST SERVICE
AND REFER TO



WASHINGTON 25

RE
FOREST SURVEY
General
(Forest Survey Manual)

April 1, 1952

Director
All Stations

Dear Sir:

Enclosed herewith is a revised Forest Survey Manual which contains a number of changes from the original Manual issued on July 1, 1949. Many of the revisions relate to matters of terminology and definitions. A few involve changes in the subject-matter requirements established in the original Manual.

Revisions of the Manual reflect experience during the past few years in both the field and report writing phases of the Survey. Most of the changes were suggested by field personnel and most have been reviewed by the Stations having Survey organizations. As in the original draft of the Manual it has been necessary to compromise a number of differing regional points of view.

The Stations should adopt the revised Manual upon its receipt. Adjustments in Survey reports and certain phases of the field work will be required, but it is believed that the Stations can adopt the indicated changes without serious difficulties.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'V. L. Harper'. The signature is written in a cursive, flowing style.

V. L. HARPER
Assistant Chief

Enclosure
cc: Regional Foresters
WO Assistant &
Division Chiefs

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE



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CHIEF, FOREST SERVICE
AND REFER TO

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RE
FOREST SURVEY
General
(Forest Survey Manual)

July 1, 1949

Director
All Stations

Dear Sir:

Transmitted herewith is the Forest Survey Manual, prepared under the authorization for a National Survey of Forest Resources (Section 9 of the McSweeney-McNary Forest Research Act of May 22, 1928 as amended).

In conducting the Survey in the past, the work has proceeded on general instructions and memoranda. The object of the manual is codification to secure the basic uniformity that has been proved desirable by past experience, and to foster State and regional estimates on a comparable basis for national use. The manual correlates regional objectives, outlines subject-matter coverage, and specifies minimum technical standards including definitions of terms. It is, like all manuals, subject to revision in the light of changing circumstances or as conditions may arise. It aims to avoid rigid standards, but within its framework provides maximum latitude for justifiable regional variations.

Preparation of the manual was preceded by three technical Forest Survey meetings, attended by representatives of Research, National Forest Administration and cooperating agencies. These meetings explored all major problems associated with conduct of the Survey. The manual itself has been under preparation since the third meeting a year and a half ago. It has been reviewed in preliminary draft by all Stations where the Forest Survey is active, by the divisions concerned in the Chief's office, and has been painstakingly revised in the light of comments received.

Directors should begin to place the manual into effect upon its receipt. Although the manual is not retroactive, adjustment of the going Survey to manual standards will necessarily require

2--Director, All Stations-- July 1, 1949

time and orderly progression from field work through to publication. Field procedures should be adapted to the manual within six months unless special circumstances justify a longer period. Special cases should be taken up with this office.

Despite the flexibility provided in the manual, all Stations may have to make some adjustments in established local practices. A sympathetic reception and a will to make the manual work are essential to its successful application.

Very truly yours,

A handwritten signature in dark ink, appearing to read "E. I. Kotok". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

E. I. KOTOK
Assistant Chief

Attachment

cc: Regional Foresters
WO Assistant &
Division Chiefs

NATIONAL SURVEY OF FOREST RESOURCES

THE FOREST SURVEY

Manual of Objectives, Subject-Matter
Coverage, Operational Standards,
and Publication of Findings

Division of Forest Economics
Forest Service
U. S. Department of Agriculture

Washington, D. C.

Initially issued July 1, 1949

Revised April 1, 1952

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1.0 Objectives and Responsibilities

Chapter 1 outlines the major objectives and responsibilities of the Forest Survey and the enabling legislation under which it operates.

1.1 Enabling legislation.

1.11 History. The Forest Survey was initiated in 1929 (F.Y. 1930) as a result of the passage of the McSweeney-McNary Forest Research Act of May 22, 1928 (45 Stat. 699; 16 U.S.C. 581 - 581i), which authorized in section 9 a total appropriation of \$3,000,000 to conduct the Forest Survey, with the proviso that not more than \$250,000 could be appropriated annually for this purpose. By an amendment of May 31, 1944 (58 Stat. 265) the Congress raised to \$6,500,000 the amount authorized to complete the first Survey with the proviso that not more than \$750,000 could be appropriated annually for this purpose. In addition, an annual appropriation of \$250,000 was authorized for resurveys in areas previously covered in order to keep the Survey current. In June 1949, the Act was again amended by the 81st Congress, first session.

1.12 Current status. Amended section 9 reads as follows:

That the Secretary of Agriculture is hereby authorized and directed, under such plans as he may determine to be fair and equitable, to cooperate with appropriate officials of each State of the United States, and either through them or directly with private and other agencies, in making and keeping current a comprehensive survey of the present and prospective requirements for timber and other forest products in the United States, and of timber supplies, including a determination of the present and potential productivity of forest land therein, and of such other facts as may be necessary in the determination of ways and means to balance the timber budget of the United States. There is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, not to exceed \$1,000,000 annually to complete the initial survey authorized by this section: Provided, That the total appropriation of Federal funds under this section to complete the initial survey shall not exceed \$11,000,000. There is additionally authorized to be appropriated not to exceed \$1,500,000 annually to keep the survey current.

1.2 Over-all responsibilities.

The over-all responsibility of the Forest Survey is to determine forest-resource facts and develop from them sound interpretations as a basis for policy and action decisions on national, regional, State, and local levels.

1.3 Specified objectives of the legislation.

The primary objective specified in the Act (section 9, as amended) is making and keeping current a comprehensive survey to collect facts necessary in the determination of ways and means to balance the timber budget of the United States. The following kinds of information are specifically mentioned in the legislation:

- a. The present and prospective requirements for timber and other forest products.
- b. Timber supplies.
- c. The present and potential productivity of forest land.
- d. Other pertinent facts.

1.4 Interpretation of legislative objectives.

The general objectives and responsibilities specified in the legislation are interpreted as follows:

- a. Collection and compilation of basic information on forest-land area, timber volume, timber growth and mortality, timber drain, timber requirements, timber volume and growth goals, ownership, and related information which bears upon balancing the timber budget. Full definition of these objectives is made in terms of subject-matter coverage in Chapter 2 of this manual.
- b. Analysis and interpretation of forest-resource facts. Other physical and economic information pertinent to the problem of balancing the timber budget and available from other sources should be utilized in order to determine the complete significance of forest-resource facts.
- c. Dissemination of forest-survey findings by publication and other means. Methods to be used for this objective are presented in Chapter 4 of this manual.
- d. By the terms of the legislation the Survey has a responsibility for "other forest products" i.e., for gathering and interpreting data on forest products other than timber. This phase of the Survey is not covered in this manual.

1.5 Scope of the Forest Survey.

- 1.51 Area covered. - The legislation applies to the 48 States. Its applicability to other possessions of the United States is not defined.

- 1.52 Land types covered. The Forest Survey deals with forest land. Data on nonforest land are limited to simple mapping and acreage compilation which is undertaken to delineate nonforest from forest.

1.6 Organization.

Conduct of the Forest Survey is the responsibility of the regional forest and range experiment Stations, Division of Forest Economics, Branch of Research, Forest Service, U. S. Department of Agriculture. Field assignments of responsibility follow boundaries of the several experiment station territories unless otherwise directed by the Assistant Chief, Branch of Research.

2.0 Subject-Matter Coverage

Chapter 2 lists required items, a few high-priority optional items, appropriate definitions, and explanations. Items designated by a single digit to the right of the decimal, such as "2.1 Land areas," are subject-matter group headings and are not required items per se. All items designated by two or more digits to the right of the decimal are required unless specifically designated "optional." A hyphen inserted between the fifth and sixth digit to the right of the decimal is an aid to legibility and has no other significance. Required and optional items are to be obtained on a State basis.

2.1 Land areas.

- 2.11 Total land area. Definition: Includes dry land and land temporarily or partially covered by water, such as marsh land, swamps, and river flood plains (omitting tidal flats); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile in width; and lakes, reservoirs, and ponds having less than 40 acres of area.

Explanation: Land areas for States, counties, and minor civil divisions given in "Areas of the United States, 1940," page 2, U. S. Bureau of the Census should be used until more recent Census figures become available, except when water bodies exceeding 40 acres in area have been created (reservoirs, for example) or when land areas exceeding 40 acres have been created through reclamation since 1940. In such cases the total land area should be adjusted for these differences.

The above definition excludes "inland water," and "water other than inland water (including coastal water)," as defined and used by the Bureau of the Census in the above reference. Since the Survey minimum area for forest and nonforest land classification is less than 40 acres in most cases, some areas ordinarily would be classified by the Survey as "water" which the Census includes in the "total land area" figure. However, to agree with the Census

definition, which is considered essential, such areas will be classified by the Survey as "nonforest land" with the following footnote explanation: "Includes _____ acres of water according to Survey standards of area classification but defined by the Bureau of the Census as land."

- 2.111 Forest land area. Definition: Includes (a) lands which are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which have not been developed for other use; (c) afforested areas; and (d) chaparral areas.

Explanation: Does not include orchard land. Pasture land will be considered forest when at least 10 percent stocked with trees. Chaparral land is defined in 2.11121. For clarification of land which will be included as forest land, see definition of nonforest land area 2.112.

The minimum area that would qualify as forest land is one acre east of the 100th Meridian. West of the 100th Meridian, the required minimum area for forest land classification, both commercial and noncommercial, is 10 acres. Where forests occur in extensive blocks without appreciable intermingled nonforest, a minimum area of 40 acres may be used provided forest areas excluded will be compensated by nonforest areas included. Roadside, streamside, and shelterbelt strips of timber, in addition to meeting above requirements, must be at least 120 feet wide to qualify as forest land.

- 2.1111 Commercial forest land area. Definition: Forest land which (a) is producing, or physically capable of producing, usable crops of wood (usually saw timber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

- 2.11111 Commercial forest land area by stand-size class.

- 2.11111-1 Saw-timber stands. Definition: East of 100th Meridian: Stands with saw-timber trees having a minimum net volume per acre of 1,500 board feet, International 1/4-inch rule. West of the 100th Meridian: Softwood stands with saw-timber trees (both softwoods and hardwoods) having a minimum net volume per acre of 4,000 board feet, International 1/4-inch rule, in the westside Sierra pine, coast range pine and Douglas-fir, and redwood subregions of Region 5, and the Douglas-fir subregion of Region 6; 1,500 board feet per acre in Regions 1, 2, 3, 4, the eastside Sierra pine subregion of Region 5, and ponderosa pine subregion of Region 6; and hardwood stands of 1,500 board feet (both hardwoods and softwoods) per acre in all regions west of the 100th Meridian.

- 2.11111-11 Old-growth saw-timber stands. Definition: Saw-timber stands in which over 50 percent of the net board-foot volume is in old-growth saw-timber trees. Explanation: Optional east of the 100th Meridian, and where not used, all saw-timber stands will be considered young growth. Old-growth saw-timber trees are defined in Appendix A. Age of physiological maturity will vary by species and site.
- 2.11111-111 Virgin old-growth saw-timber stands. Optional item. Definition: Old-growth saw-timber stands that have not been cut, or have been cut so lightly as not to make any material change in the original forest canopy or quality of the original stand.
- 2.11111-112 Residual old-growth saw-timber stands. Optional item. Definition: Old-growth stands that have been materially changed by cutting.
- 2.11111-12 Young-growth saw-timber stands. Definition: Saw-timber stands in which 50 percent or more of the net board-foot volume is in young-growth saw-timber trees.
- 2.11111-121 Large young-growth saw-timber stands. Optional item west of the 100th Meridian. Definition: Young-growth saw-timber stands having more than 50 percent of the net young-growth board-foot volume in large young-growth saw-timber trees. Explanation: Large young-growth saw-timber trees are defined in Appendix A. In mixed stands the volume of softwoods and hardwoods will be added together in determining stand classification. In statements regarding the area and volume in large young-growth saw timber a general description of the character of stands included in this class will be given to explain that in some parts of the East, areas are included in large young-growth saw-timber stands which contain only a few large trees.
- 2.11111-122 Small young-growth saw-timber stands. Optional item west of the 100th Meridian. Definition: Young-growth saw-timber stands having 50 percent or more of the net young-growth board-foot volume in small young-growth saw-timber trees. Explanation: Small young-growth saw-timber trees are defined in Appendix A.
- 2.11111-123 Well- and medium-stocked stands. Definition: Stands that are 40 percent or more stocked with present or potential growing stock trees. Explanation: Stocking is defined in Appendix A.
- 2.11111-1231 Well- and medium-stocked with saw timber. Optional. Explanation: Include young-growth saw-timber stands that are 40 percent or more stocked with live-saw-timber trees. This is not a substitute for 2.11111-123.
- 2.11111-124 Poorly stocked stands. Definition: Stands that are 10 - 39 percent stocked with present or potential growing stock trees.
- 2.11111-1241 Poorly stocked with saw timber. Optional. Definition: Include young growth saw-timber stands that are 10 - 39 percent stocked with saw-timber trees. This item is not a substitute for 2.11111-124.

- 2.11111-2 Pole-timber stands. Definition: Stands failing to meet the saw-timber stands specification, but at least 10 percent stocked (defined in Appendix A) with pole-timber and larger (5.0 inches d.b.h. and larger) trees and with at least half the minimum stocking in pole-timber trees. Explanation: The last clause in the definition prevents stands that are 10 percent or more stocked with saw-timber and pole-timber trees, but with insufficient board-foot volume to qualify as saw-timber stands, and bearing few or no pole-timber trees, from being classed as pole-timber stands. Such areas would be classed nonstocked or seedlings and saplings.
- 2.11111-21 Well- and medium-stocked stands. Definition: Stands that are 40 percent or more stocked with present or potential growing stock trees.
- 2.11111-22 Poorly stocked stands. Definition: Stands that are 10 to 39 percent stocked with present or potential growing stock trees.
- 2.11111-3 Seedling and sapling stands. Definition: Stands not qualifying as either saw-timber or pole-timber stands, but having at least 10 percent stocking of trees of commercial species and with at least half the minimum stocking in seedling and sapling trees.
- 2.11111-31 Well- and medium-stocked stands. Definition: Stands that are 40 percent or more stocked with present or potential growing stock trees.
- 2.11111-32 Poorly stocked stands. Definition: Stands that are 10 to 39 percent stocked with present or potential growing stock trees.
- 2.11111-4 Nonstocked and other areas not elsewhere classified. Definition: Areas not qualifying as saw-timber, pole-timber, or seedling and sapling stands. Explanation: May include areas with over 10 percent stocking; for example, stands more than 10 percent stocked with saw-timber trees but with insufficient board-foot volume to qualify as saw-timber stands.
- 2.11112 Commercial forest land area by ownership class by stand-size class.
- 2.11112-1 National forest ownership. Definition: Federal lands which, by executive order or statute, have been designated as national forests, purchase units, or experimental areas or have been placed under the administration of the Forest Service. Explanation: The last clause in the above definition covers land-utilization areas.
- 2.11112-11 Saw-timber stands. Explanation: Show total area of saw-timber stands in national forest ownership with no further breakdown required.
- 2.11112-12 Pole-timber stands. Explanation: Show total area of pole-timber stands in national forest ownership with no further breakdown required.

- 2.11112-13 Seedling and sapling stands. Explanation: Show total area of seedling and sapling stands in national forest ownership with no further breakdown required.
- 2.11112-14 Nonstocked and other areas not elsewhere classified. Explanation: Show total nonstocked and other areas not elsewhere classified in national forest ownership.
- 2.11112-2 Indian ownership. Definition: Indian tribal lands and trust allotments, i.e., lands held in fee by the Federal Government but administered and managed for Indian tribal groups, or allotted in trust to individual Indians. Explanation: Include same stand-size class breakdown as under national-forest ownership. Do not include patented lands owned by Indians; they will be classified as private land.
- 2.11112-3 Other Federal ownership. Definition: Lands owned by the Federal Government not classed as national forest, Indian, or State. Explanation: Include stand-size class breakdown as under national-forest ownership.
- 2.11112-4 State ownership. Definition: Lands in State ownership or lands under lease to States for 50 years or more. Explanation: Include same stand-size class breakdown as under national-forest ownership.
- 2.11112-5 County and municipal ownership. Definition: Lands in county or municipal ownership. Explanation: Include same stand-size class breakdown as under national-forest ownership.
- 2.11112-6 Private ownership. Definition: Land in private ownership. Explanation: Include same stand-size class breakdown as under national-forest ownership. Do not include public lands under lease or contract of sale to private parties.
- 2.11112-61 Farm ownership. Definition: Private commercial forest land in farms, using as the definition of "farm" the official definition in the latest Census of Agriculture. Explanation: Show total commercial forest land ownership only; no stand-size class breakdown is required.
- 2.11112-62 Other private ownership. Definition: Commercial forest land in private ownership other than farm. Explanation: Show total commercial forest land only, no stand-size class breakdown is required. It is optional but of HIGH PRIORITY to classify this category of ownership into 3 size classes as follows: 1 - 4,999 acres, 5,000 - 49,999 acres, and 50,000 acres and over; and into the following minimum classes of ownership intent: (1) to hold for sale of timber and land at a higher price; (2) to hold and manage timber as a crop for use in own wood-using plant; (3) to hold and manage timber for sale as a crop; (4) to liquidate timber values and dispose of land or convert to other use; and (5) to use for other purposes.

- 2.11113 Commercial forest land area by major types. Explanation: Acreages should be given for each of the following major types. No breakdown by stand-size class or ownership is required; but both breakdowns, though optional, are desirable. Forest types, defined in Appendix A, are:

Eastern Types

White-red-jack pine
 Spruce-fir
 Longleaf-slash pine
 Loblolly-shortleaf pine
 Oak-pine
 Oak-hickory
 Oak-gum-cypress
 Elm-ash-cottonwood
 Maple-beech-birch
 Aspen-birch

Western Types

Douglas-fir
 Hemlock-Sitka spruce
 Redwood
 Ponderosa pine
 White pine
 Lodgepole pine
 Larch
 Fir-spruce
 Pinyon pine-juniper
 Hardwoods

- 2.1112 Noncommercial forest land area. Definition: Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land, and (b) incapable of yielding usable wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.
- 2.11121 Area reserved from commercial timber use. Definition: Forest land withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land.
- 2.11122 Area unproductive for timber use. Definition: Forest land incapable of yielding usable wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.
- 2.11122-1 Chaparral land area. Definition: Lands supporting heavily branched dwarf trees or shrubs, usually evergreen, the crown canopy of which covers more than 50 percent of the ground and whose primary value is watershed protection. The more common chaparral constituents are species of Quercus, Cercocarpus, Garrya, Ceanothus, Arctostaphylos, and Adenostoma. Types dominated by such shrubs as Artemisia, Opuntia, Purshia, Gutierrezia, or semi-desert species are not commonly considered chaparral.
- 2.11122-2 Withdrawn for special uses. Explanation: Includes wilderness areas set aside for recreational use and other areas where use is restricted by statute or administrative order.

2.112 Nonforest land area. Definition: Land that does not qualify as forest land. Explanation: The minimum area recognized as nonforest land is one acre east of the 100th Meridian. West of the 100th Meridian the minimum area is 10 acres except where forests occur in extensive blocks when a minimum area of 40 acres may be used, provided forest areas included are compensated by nonforest areas excluded. Unimproved roads, streams, canals, rights-of-way, clearings, and treeless strips must be at least 120 feet wide to qualify as nonforest land. Improved roads, regardless of width, will be classified as nonforest land. Includes land which has never supported forest growth; land from which the forest has been removed to less than 10 percent stocking and has been developed for other use, such as grazing, agricultural, residential, or industrial; all land in thickly populated urban and suburban areas, and water classified by the Bureau of the Census as land (section 2.11).

2.2 Forest type maps.

- 2.21 Generalized forest type maps. Explanation: A generalized forest type map is required upon completion of each State. Scale should be 1 or one inch equals approximately 40 miles. Forest 2,500,000 types listed in 2.11113 and defined in Appendix A should apply to "commercial forest land" (2.1111) and "areas reserved from commercial timber use" (2.11121). In addition there should be a noncommercial type applying to "areas unproductive for timber use" (2.11122). Any area of 100 square miles having 10 percent or more of forest land should be shown on the map. Smaller units of area may be shown on the maps at the Stations' discretion if of importance. Use appropriate type colors shown in Appendix E. Major river-bottom stringers too narrow to show on a map of this scale should be shown diagrammatically. Details of map standards, method of publication, and type legend are given in 3.57, 4.5, and Appendix E respectively.
- 2.22 Detailed forest type maps. A detailed forest type map is required west of the 100th Meridian, unless exception is approved by the W. O., at a scale of one inch equals one mile, or one inch equals two miles. These maps should cover only the commercial forest zone and intermingled and adjacent noncommercial forest areas. Specifications include: (a) major forest types defined in Appendix A or local subtypes thereof; (b) a noncommercial forest type corresponding to noncommercial forest land; (c) type mapping of reserved forest land may be omitted except national forest reserved areas; (d) minimum type area of 40 acres (this does not invalidate the specification in 2.111 that forest land should be classified in most cases to a 10-acre minimum for determination of total forest land area west of the 100th Meridian); (e) stand-size class designations. Additional detail such as stand structure, density, site, soil type, stocking, or showing of chaparral land are desirable but ordinarily will have to be financed from cooperative funds.

2.3 Volume

2.31 Saw-timber volume. Definition: Net volume in board feet, International 1/4 inch rule, of live and salvable dead saw-timber trees to a merchantable top.

Explanation: To properly interpret the above definition, it is necessary to understand the following terms: net volume, saw-timber trees, commercial species, merchantable top, and salvable dead trees. The meaning of these terms in the Forest Survey is given in Appendix A. If allowance for breakage is deducted in determining net volume of old-growth stands in the Douglas-fir and redwood regions on the West Coast, net volume estimates should be footnoted to show volume of breakage.

2.311 Live saw-timber volume. Definition: Net volume in board feet, International 1/4 inch rule, of live saw-timber trees.

2.3111 Commercial forest land.

2.31111 Stand-size class. Explanation: Show live saw-timber volume for each of the following 4 major stand-size classes (no breakdown of stand-size classes required):

2.31111-1 Saw-timber stands.

2.31111-2 Pole-timber stands.

2.31111-3 Seedling and sapling stands.

2.31111-4 Nonstocked and other areas not elsewhere classified.

2.31112 Ownership class. Explanation: Show live saw-timber volume for each of the following ownership classes.

2.31112-1 National forest ownership.

2.31112-2 Indian ownership.

2.31112-3 Other Federal ownership.

2.31112-4 State ownership.

2.31112-5 County and municipal ownership.

2.31112-6 Private ownership.

2.31112-61 Farm ownership.

2.31112-62 Other private ownership.

- 2.31113 Species. Explanation: Show live saw-timber volumes for each of the species or group of species listed below. This is a minimum list for national compilation; Stations may show additional species of local importance but data submitted to Washington should agree with this list or be additive to it. Some species listed may be of little importance in some regions and need not be shown individually in regional or State tables, but should be obtained and made available to Washington to make national totals complete.

Eastern Softwoods

Longleaf and slash pines
Shortleaf and loblolly pines
Other southern yellow pines
Spruce and balsam fir
White and red pines
Jack pine
Hemlock
Cypress
Other eastern softwoods

Western Softwoods

Douglas-fir
Ponderosa & Jeffrey pines
True firs
Western hemlock
Sugar pine
Western white pine
Redwood
Sitka spruce
Engelmann and other spruces
Western larch
Western redcedar
California incensecedar
Lodgepole pine
Other western softwoods

Eastern Hardwoods

White oaks (Q. alba & prinus)
Red oaks (Q. borealis & falcata
var. pagodaefolia)
Other white oaks
Other red oaks
Yellow birch
Sugar maple
Soft maples
Beech
Sweetgum
Tupelo and blackgum
Ash
Hickory
Cottonwood and aspen
Basswood
Yellow poplar
Black walnut
Other eastern hardwoods

Western Hardwoods

Aspen
Red alder
Other western hardwoods

- 2.31114 Log-quality class. Explanation: Show live saw-timber volume by log grades for the entire merchantable bole of all eastern hardwoods, for at least the first 32 feet of the merchantable bole of the following western softwoods, and the first 16 feet of the following eastern softwoods:

Eastern Softwoods

Southern yellow pines
White and red pines
Cypress
Additional species
as desired

Western Softwoods

Douglas-fir
Ponderosa & Jeffrey pines
Western white pine
Sugar pine
Additional species as desired

Where official log grades have been established by the Forest Service (see Appendix A) they should be accepted by all Stations involved, otherwise regional log grades may be used.

2.31115 Diameter class group. Explanation: As a minimum, show live saw-timber volume of the following species by the indicated diameter classes:

- (a) Eastern: Southern yellow pines, white and red pines, other eastern softwoods, white oaks (Q. alba & prinus), other white oaks, red oaks (Q. borealis and falcata var. pagodaefolia), other red oaks, yellow birch, sugar maple, beech, sweetgum, tupelo and blackgum, yellow poplar, and other eastern hardwoods. Show by 2-inch diameter classes for trees 9.0 - 18.9 inches d.b.h. for softwoods and 11.0 - 18.9 inches d.b.h. for hardwoods, and 19.0 inches and larger for all species.
- (b) Western: Douglas-fir, ponderosa and Jeffrey pines, sugar pine, western white pine, redwood, other western softwoods, and western hardwoods - 11.0 - 20.9 inches d.b.h., 21.0 - 30.9 inches, 31.0 - 40.9 inches, and 41.0 inches and larger.

Stations should show similar data for additional species of local importance, and for additional diameter classes when significant from standpoint of log or tree grades.

2.31116 Number of trees. Explanation: Show separately by softwoods and hardwoods the number of trees by the diameter classes specified in 2.31115, pole-timber trees by 2-inch classes, and 2- and 4-inch trees considered potential pole-timber trees.

2.3112 Noncommercial forest land. Explanation: Empirical estimates of live saw-timber volume on areas reserved from commercial timber use by administrative order, such as wilderness areas, should be made but should be properly qualified. Saw-timber volumes on national parks and monuments should not be estimated. Volumes on other reserved areas, such as State parks, may be estimated at the discretion of the Stations. Permission of appropriate officials should be obtained prior to field examination or publication of volume data for any reserved areas. Breakdown of estimates by ownership and species is desirable but optional.

2.312 Salvable dead saw-timber volume. Definition: Net volume in board feet, International 1/4-inch rule, of salvable dead saw-timber trees.

Explanation: Show volume separately by softwoods and hardwoods on commercial forest land. No separation by ownership, stand-size class, area, or species required.

2.32 All-timber volume. Definition: Net volume in cubic feet of live and salvable dead saw-timber trees and pole-timber trees of commercial species, and cull trees of all species, from stump to a

minimum 4.0-inch top inside bark. Includes bole only of softwoods but both bole and limbs of hardwoods to a minimum 4.0-inch diameter inside bark.

2.321 Live all-timber volume. Definition: Net volume in cubic feet of live saw-timber trees and live pole-timber trees of commercial species, and cull trees of all species.

2.3211 Commercial forest land.

2.32111 Growing stock volume. Definition: Net volume in cubic feet of live saw-timber trees and live pole-timber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

Explanation: Include central bole only of (a) softwoods and (b) hardwoods to the point where the central bole breaks into limbs or has a 4.0-inch diameter inside bark whichever comes first. Exclude cull trees and limbs of hardwoods and softwoods.

2.32111-1 Stand-size class. Explanation: Show volume for each of the four major stand-size class areas listed, defined, and explained under 2.11111. No breakdown of stand-size class required.

2.32111-2 Ownership class. Explanation: Show volume of each of the six major classes of ownership listed, defined, and explained under 2.11112. Show private farm and nonfarm ownership separately.

2.32111-3 Species. Explanation: Show volume for each of the species and species groups listed in 2.31113.

2.32111-4 Softwoods.

2.32111-41 Live saw-timber trees.

2.32111-411 Sawlog portion. Definition: Net volume in cubic feet of live saw-timber trees between stump and merchantable top.

2.32111-412 Upper stem portion. Definition: Net volume in cubic feet of bole of live saw-timber trees between merchantable top and a point on the bole with a minimum top 4.0 inches in diameter inside bark when it exists.

Explanation: In softwoods, the top often breaks off below the 4.0-inch minimum; in hardwoods, the top of the bole often breaks up into limbs before the 4.0-inch minimum is reached.

2.32111-42 Live pole-timber trees.

2.32111-5 Hardwoods.

2.32111-51 Live saw-timber trees.

2.32111-511 Sawlog portion.

2.32111-512 Upper stem portion.

2.32111-52 Live pole-timber trees.

2.32112 Cull tree volume. Definition: Net volume in cubic feet of live trees of saw-timber or pole-timber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species.

2.32112-1 Sound cull trees. Definition: Live trees of saw-timber or pole-timber size which meet regional specifications of freedom from rot but will not make at least one merchantable sawlog now or prospectively according to the regional specifications because of roughness, poor form, or species.

Explanation: Current or prospective suitability for sawlogs is used as the criterion of merchantability even in pole-timber size trees. This does not preclude use of cull trees for pulpwood or other products.

2.32112-11 Softwoods.

2.32112-111 Saw-timber size trees.

2.32112-112 Pole-timber size trees.

2.32112-12 Hardwoods.

2.32112-121 Saw-timber size trees.

2.32112-122 Pole-timber size trees.

2.32112-2 Rotten cull trees. Definition: Live trees of saw-timber or pole-timber size which fail to meet regional specifications of proportion of sound volume to total volume.

2.32112-21 Softwoods.

2.32112-211 Saw-timber size trees.

2.32112-212 Pole-timber size trees.

2.32112-22 Hardwoods.

2.32112-221 Saw-timber size trees.

2.32112-222 Pole-timber size trees.

- 2.32113 Hardwood limb volume. Definition: Net volume in cubic feet of limbs of live hardwood saw-timber trees and saw-timber size cull hardwood trees to a minimum diameter of 4.0 inches inside bark.
- 2.3212 Noncommercial forest land. Explanation: Empirical estimates of growing stock volume on areas reserved from commercial timber use by administrative order, such as wilderness areas, should be made, but should be properly qualified. All-timber volumes on national parks and monuments should not be estimated. Volumes on other reserved areas such as State parks may be estimated at the discretion of the Stations. Permission of appropriate officials should be obtained prior to field examination or publication of volume data for any reserved areas.
- 2.322 Salvable dead all-timber volume. Definition: Net volume in cubic feet of salvable dead saw-timber and pole-timber trees.
- Explanation: Show only total cubic volume on commercial forest land by softwoods and hardwoods. No breakdown by stand-size class, species, etc. is required.
- 2.4 Growth.
- 2.41 Net annual growth of saw timber. Definition: The change during a specified year in net board-foot volume of live saw timber on commercial forest land resulting from natural causes exclusive of catastrophic losses.
- Explanation: The above definition expresses the objective of current annual growth determination during the inventory year. Problems in technique require the use of average growth of a period of years usually centering around the inventory year. The definition does not prescribe methodology. The components of net annual growth are (a) the increment in net volume during the inventory year of all trees included in live saw timber at the beginning of the inventory year and surviving to its end; (b) the increment in net volume during the inventory year of all trees included in live saw timber that were cut or died during the inventory year; (c) the total net board-foot volume of trees that entered live saw timber during the inventory year measured at the end of the year; and (d) annual mortality (defined in 2.521). Net growth then would be expressed by the formula: $a + b + c - d = \text{net growth}$. Show total board-foot volume growth; no breakdown by stand-size class required.
- 2.411 Species and species group. Explanation: As a minimum, net annual growth should be shown for the following species or species combinations by the Stations listed:

East

SS) - Southern yellow pines
) - Other softwoods
 SE) - Soft hardwoods
) - Hard hardwoods

 LS) - Spruce & fir
 CS) - Other softwoods
 NE) - Soft hardwoods
) - Hard hardwoods

West

) - Redwood
) - Ponderosa & Jeffrey pine
 CAL) - Douglas-fir
) - Other softwoods
) - Hardwoods

) - Douglas-fir
) - Ponderosa pine
 PNW) - Other softwoods
) - Hardwoods

) - Western white pine
 INT) - Ponderosa pine
 NRM) - Douglas-fir
 RM) - Other softwoods
) - Hardwoods

) - Ponderosa pine
) - Douglas-fir
 SW) - Other softwoods
) - Hardwoods

2.412 Ownership class. Explanation: Show net annual saw-timber growth for national forest ownership class by States, west of the 100th Meridian only. Release outside the Forest Service subject to approval of the Chief's office.

2.413 Log quality. Optional. Explanation: Show net board-foot growth by log grades indicated in 2.31114.

2.42 Net annual growth of growing stock. Definition: The change during a specified year in net cubic-foot volume of growing stock on commercial forest land resulting from natural causes exclusive of catastrophic losses.

Explanation: The components of net annual growth of growing stock are (a) the increment in net cubic-foot volume of all trees included in the growing stock at the beginning of the inventory year and surviving to its end; (b) the increment in net cubic-foot volume during the inventory year of all trees included in the growing stock that were cut or died during the inventory year; (c) the total net cubic-foot volume of trees that entered the growing stock during the inventory year measured at the end of the year; and (d) annual mortality (defined in 2.522). Net growth then would be expressed by the formula: $a + b + c - d = \text{net growth}$.

2.421 Stand-size class.

2.4211 Saw-timber stands.

2.4212 Pole-timber stands, seedling and sapling stands, and nonstocked and other areas not elsewhere classified. Explanation: Show net annual cubic-foot growth of growing stock in the three stand-size classes combined.

2.422 Species groups.

2.4221 Softwoods.

2.4222 Hardwoods.

2.423 Tree-size class. Explanation: Provision must be made in methodology for growth of trees entering and leaving pole-timber class and trees entering saw-timber class.

2.4231 Saw-timber trees.

2.4232 Pole-timber trees.

2.5 Mortality.

2.51 Catastrophic timber mortality. Definition: The net volume removed from live saw timber or from growing stock on commercial forest land during a specified period through death from natural causes of extreme severity.

Explanation: The loss in volume must be of sufficient quantity to cause a major dislocation of forest management and timber-utilization plans for a State or subregion and require correction of inventory volumes by special field survey. Examples of catastrophes are unusually severe insect attack, an extraordinary windstorm such as the New England hurricane, or a holocaust such as the Tillamook burn. It is characterized by its unpredictable nature, suddenness and concentration of occurrence, as well as the extreme quantity of destruction. Although the loss usually is suffered in a period less than a year, it may extend over more than a year as in insect attacks. It will be treated as a correction of live saw-timber volume or the growing-stock volume, not as a part of normal mortality for determining net annual growth. Proposals to classify mortality as catastrophic should be referred to the Washington Office.

2.511 Catastrophic saw-timber mortality. Definition: Net board-foot volume removed from the live saw timber as a result of catastrophic mortality.

2.5111 Stand-size class. Explanation: Show total volume for each of the four major stand-size classes listed, defined, and explained under 2.11111. No breakdown of stand-size class is required.

- 2.5112 Ownership class. Explanation: Show total volume for each of the six classes of ownership listed, defined, and explained under 2.11112. Do not show for private farm and nonfarm ownership separately.
- 2.5113 Species. Explanation: Show volume for each of the species listed, defined, and explained under 2.31113.
- 2.512 Catastrophic growing stock mortality. Definition: Net cubic-foot volume removed from the growing stock as a result of catastrophic mortality.
- 2.5121 Stand-size class. Explanation: Show total volume for each of the four major stand-size classes listed, defined, and explained under 2.11111. No breakdown of stand-size class is required.
- 2.5122 Ownership class. Explanation: Show total volume for each of the six classes of ownership listed, defined, and explained under 2.11112. Do not show for private farm and nonfarm separately.
- 2.5123 Species. Explanation: Show total volume for each of the species listed, defined, and explained under 2.31113.
- 2.5124 Species group, tree-size class and class of material. Explanation: Show total volume for each of the items listed, defined, and explained under 2.32111-4 and 2.32111-5.
- 2.52 Annual timber mortality. Definition: The net volume removed from live saw timber or growing stock on commercial forest land during a specified year through death from natural causes, but not as the result of catastrophes.

Explanation: The objective is to obtain volume of mortality during the inventory year. Actually owing to problems of methodology it will represent an average of a recent period of years. The values obtained under the above definition would express the element "d" of the net annual growth formula " $a + b + c - d = \text{net growth}$."

Include trees dying as a result of turpentining. Mortality of cull trees and limbs is omitted because determination of growth is not required for such material and because of the difficulties of determination.

- 2.521 Annual mortality of saw timber. Definition: The net board-foot volume removed from live saw timber during a specified year through death from natural causes.

Explanation: Show board-foot volume of mortality; no breakdown by stand-size class is required.

- 2.5211 Species and species group. Explanation: Show annual mortality for each of species or species group listed under 2.411.
- 2.5212 Ownership class. Explanation: Show annual mortality for national forests west of the 100th Meridian as explained under 2.412.
- 2.5213 Cause. Explanation: Show separately, mortality from (a) fire, (b) insects, (c) disease, and (d) other causes such as wind, etc.
- 2.522 Annual mortality of growing stock. Definition: The net cubic-foot volume removed from growing stock during a specified year through death from natural causes.
- 2.5221 Stand-size class.
- 2.52211 Saw-timber stands.
- 2.52212 Pole-timber stands, seedling and sapling stands, and nonstocked and other areas not elsewhere classified. Explanation: Show total cubic-foot mortality of growing stock in the three stand-size classes combined.
- 2.5222 Species group.
- 2.52221 Softwoods.
- 2.52222 Hardwoods.
- 2.5223 Tree-size class.
- 2.52231 Saw-timber trees.
- 2.52232 Pole-timber trees.
- 2.5224 Cause. Explanation: Show separately, mortality from (a) fire, (b) insects, (c) disease, and (d) other causes such as wind, etc.
- 2.6 Timber products output and timber drain. Explanation: Information for all subsections of this item should ordinarily be shown for the year of inventory except when such recent annual data are not considered representative the average for a period of years may be used.
- 2.61 Timber products output. Definition: The volume of timber products cut from both growing stock and other miscellaneous sources.

Explanation: Determination of the volume of production of "manufactured" timber products is normally a function of the Bureau of the Census. The Forest Survey should use such data as are available from the Census or other sources, but must obtain estimates of production of all manufactured and nonmanufactured timber products, and the portion of each product obtained from growing stock, saw-timber trees, and other sources. Periodicity of surveys to obtain information on production of timber products in collaboration with the Bureau of the Census are explained in 3.551.

2.611 Timber products from live saw timber.

2.6111 Products. Explanation: Show board-foot volume for each product listed in 3.56.

2.6112 Species. Explanation: Show board-foot volume for species or species groups listed in 2.411.

2.6113 Log quality. Optional. Explanation: Show board-foot volume by log grades indicated in 2.31111.

2.612 Timber products from growing stock.

2.6121 Products. Explanation: Show volume in standard units and cubic feet for each product listed in 3.56.

2.6122 Species groups. Explanation: Show cubic-foot volume separately for softwoods and hardwoods.

2.6123 Tree classes. Explanation: Show cubic-foot volume separately for saw-timber trees and pole-timber trees.

2.613 Timber products from miscellaneous sources. Definition: The volume of timber products cut from cull trees, limbs, dead trees, timber on noncommercial and nonforest land, and overutilization of growing stock.

Explanation: This volume is not part of "drain" but is included to show total output of timber products by forest industries.

2.62 Total annual drain on live saw timber. Definition: The board-foot volume of live saw-timber trees removed from commercial forest land during a specified year through commodity drain and land clearing and cultural operations.

2.621 Commodity drain on live saw timber. Definition: The board-foot volume of live saw timber trees removed from commercial forest land during a specified year as timber products and logging waste.

2.6211 Timber products from live saw timber. (Identical with 2.611)

2.62111 Products. Explanation: Show board-foot volume for each product listed in 3.56.

- 2.62112 Species. Explanation: Show board-foot volume for species or species groups listed in 2.411.
- 2.62113 Log quality. Optional. Explanation: Show board-foot volume by log grades indicated in 2.31111.
- 2.6212 Logging waste of live saw timber. Definition: The board-foot volume of live saw-timber trees cut or killed by logging on commercial forest land and not converted to timber products.
- Explanation: Estimates of net volume of standing timber and of logging waste ordinarily include material broken during logging; however, in estimates for old-growth Douglas-fir and redwood stands on the West Coast an "allowance for breakage" may be excluded from net inventory volume and handled as a separate item. In such case the volume of "breakage" should be indicated by appropriate footnotes in tables on net volume.
- (See 2.6211 for breakdown of this item)
- 2.622 Land clearing and cultural operations drain on live saw timber. Definition: The board-foot volume of live saw-timber trees removed from commercial forest land by land clearing and cultural operations during a specified year and not converted to timber products. Explanation: Usually a negligible item. Includes clearing for agriculture, reservoirs, etc. An empirical estimate of volume by species shown in 2.411 should be made to complete estimates of total annual drain on saw timber. When of limited importance estimates for this item may be included with "logging waste" in the standard tables.
- 2.63 Total annual drain on growing stock. Definition: The cubic-foot volume of live saw-timber and pole-timber trees removed from commercial forest land during a specified year through commodity drain and land clearing and cultural operations.
- 2.631 Commodity drain on growing stock. Definition: The cubic-foot volume of live saw-timber and pole-timber trees removed from commercial forest land during a specified year as timber products and logging waste.
- 2.6311 Timber products from growing stock. (Identical with 2.612)
- 2.63121 Products. Explanation: Show volume in standard units and cubic feet for each product listed in 3.56.
- 2.63122 Species groups. Explanation: Show cubic-foot volume separately for softwoods and hardwoods.
- 2.63123 Tree classes. Explanation: Show cubic-foot volume separately for saw-timber trees and pole-timber trees.

- 2.6312 Logging waste of growing stock. Definition: The cubic-foot volume of live saw-timber and pole-timber trees cut or killed by logging on commercial forest land and not converted to timber products. Explanation: Estimates of net volume of standing timber and of logging waste ordinarily include material broken during logging; however, in estimates for old-growth Douglas-fir and redwood stands on the West Coast an "allowance for breakage" may be excluded from net inventory volume and handled as a separate item. In such case the volume of "breakage" should be indicated by appropriate footnotes in tables on net volume. (See 2.6311 for breakdown.)
- 2.632 Land clearing and cultural operations drain on growing stock. Definition: The cubic-foot volume of live saw-timber and pole-timber trees removed from commercial forest land by land clearing and cultural operations during a specified year and not converted to timber products. Explanation: Usually a negligible item. Includes clearing for agriculture, reservoirs, etc. An empirical estimate of volume by species shown in 2.411 should be made to complete estimates of total annual drain on saw timber. When of limited importance estimates for this item may be included with "logging waste" in the standard tables.
- 2.7 Timber volume and growth goals.
- 2.71 Growing stock required to sustain current level of commodity drain. Definition: The minimum live saw-timber volume and growing-stock volume on commercial forest land required to sustain permanently the levels of commodity drain during a specified year. Explanation: The objective of this item is to determine changes in live saw-timber and growing-stock volumes necessary to support established levels of industrial activity. Assume that management practices and commodity drain will remain constant at the level of the inventory year. Determination of short-range growth goals may be a necessary tool in this calculation but growth goals are not required as a subject-matter item. Eventually the growth goals to support current drain levels should be identical to them. Intermediate growth goals might be greater or less than the current drain depending upon the current condition of the inventory.
- 2.711 Live saw-timber. Explanation: Show net board-foot volume.
- 2.7111 Softwoods.
- 2.7112 Hardwoods.
- 2.712 Growing stock. Explanation: Show cubic-foot volume.
- 2.7121 Softwoods.
- 2.7122 Hardwoods.
- 2.72 Allowable cut. Optional. Definition: The volume of live saw timber and growing stock that can be cut during a given period while building up or maintaining sufficient growing stock to meet specified growth goals.

- 2.73 Potential growth under the Forest Program. Definition: The annual growth on commercial forest land which would be obtained 50 years from the inventory year if the Forest Program measures were fully applied during the entire period.

Explanation: The primary purpose of this section is to satisfy the responsibility for determining "potential productivity of forest land" specified in Section 9 of the McSweeney-McNary Forest Research Act. Determination of the biological-potential growth would not satisfy this purpose since it is unrealistic. To qualify biological-potential growth by economic considerations involves forecasts of future economic conditions that are very difficult to translate into effect on forest growth.

In order to determine growth effects of the Forest Program measures, it will be necessary to assume rates of drain or withdrawals on growing stock. Pending a new appraisal of the Nation's timber situation, use as a basis the drain figures given in Table 29, Reappraisal Report No. 1, "Gaging the Timber Resource of the United States." Take the figures in the second (1945-50) column as the drain for the first decade after the inventory year regardless of when the inventory year actually occurs. Thereafter use data in the next four columns for the succeeding four decades respectively. Drain figures for the reappraisal regions will be apportioned among States by the Stations. Where reappraisal regions do not agree with Station regions, the Stations concerned should agree on assignment of drain to States involved. The Forest Program measures are summarized in U.S.D.A. Miscellaneous Publication 668. Additional detail on Forest Program measures is available in the W.O. and the field. Estimates will be shown in table 15 in Appendix D, but should not be released without prior approval of the Chief's office.

- 2.731 Potential growth of saw timber. Explanation: Show total volume in board feet. No other breakdown is required.
- 2.732 Potential growth of growing stock. Explanation: Show total volume in cubic feet. No other breakdown is required.
- 2.74 Potential timber volume under the Forest Program. Definition: The volume of live saw timber and growing stock on commercial forest land which would result 50 years from the inventory year if the Forest Program measures were fully applied during the entire period.
Explanation: Use same assumptions and material specified in section 2.73. Do not release without prior approval of the Chief's office.
- 2.741 Potential live saw-timber. Explanation: Show total board-foot volume only. No further breakdown is required.
- 2.742 Potential growing stock. Explanation: Show total cubic-foot volume only. No further breakdown is required.

3.0 Operational Procedures and Standards

Chapter 3 describes the procedures and standards essential to obtain efficiency and limited uniformity in operational phases of the Forest Survey, and at the same time allow sufficient latitude to permit justifiable regional variations. Material was included if judged of national significance and no attempt was made to descend below this level. In cases where Federal, Departmental, or Forest Service policy govern, reference is made to the proper authority or copies of the policy letter or statements are included in the Appendices.

Specifically, this chapter seeks to establish procedural guide lines necessary to satisfy the subject-matter requirements specified in Chapter 2.

3.1 Administration and organization. The following paragraphs relate to general problems of administration and organization of particular interest to the Forest Survey. Not included are the general rules, regulations, and policies commonly employed in administration and organization of Forest Service work, and with which all employees in responsible positions are considered familiar.

3.11 Work programs.

3.111 Preparation of work programs. Following the issuance of this manual, Stations should revise current work programs and field handbooks for their respective regions incorporating changes in methodology, subject-matter coverage, and work schedules to the extent necessary to meet requirements of this manual.

3.112 Contents of work programs. There should be separate work programs for initial and maintenance work, covering all major phases of the Forest Survey, except requirements, and including:

- a. A description of general system or methodology to be used, including sampling aspects.
- b. Any recommendations of variance with manual specifications with respect to subject matter, intensity, or periodicity.
- c. Organizational plan showing positions, manpower, and functions.
- d. Anticipated costs by unit area, survey phase, field and office work, and overhead expenses.
- e. Field and office schedule showing anticipated date of work initiation and completion for each unit area.
- f. Report program showing anticipated date of completion for each required report.
- g. Cooperation—anticipated or planned—and statement of nature of cooperation and effect of cooperation on survey programs.

3.113 Guides to priority of work schedules. Selection of States for work is generally a regional responsibility, but two factors which should be considered in arranging work schedules are: availability of adequate aerial photography and the nature and extent of cooperative assistance. As a general policy, preference should be given those areas where adequate photographic coverage is available. Areas not having aerial photographic coverage should be of low priority except when such areas are intermingled with areas adequately covered by aerial photography. Areas where State or other cooperative help is available should ordinarily be scheduled ahead of areas where cooperative help is not available.

3.114 Procedure for submission and review. Because of the interregional character of the Forest Survey, work programs or major revisions thereof should be submitted in triplicate to the Chief's office for review and approval.

In reviewing work programs the Washington office will be concerned primarily with the adequacy of the program to meet the over-all specifications of this manual. Procedural details such as are included in the Stations' field manuals, i.e., photo and ground plot classification, plot size and shape, two-step vs. three-step system, are Station responsibilities. The Chief's office will concern itself with such details only when interstation differences result in lack of coordination or when procedures used appear less efficient or more costly than others available.

3.115 Station field manuals. Prior approval of the Chief's office is not required for field manuals, but three copies should be sent to Washington for information. Likewise, amendments to field manuals should be supplied the Chief's office.

3.116 Changes in work schedules. Departure from previously announced schedules altering priority in a major way, such as delay of a year or advancement of a year in the survey of a State or major unit, should be cleared with the Chief's office.

3.12 Clearance of forms and statistical plans. In order to avoid duplication of effort and minimize the cost to the Government and the burden upon the public, the use of reporting forms and questionnaires addressed to respondents by Federal agencies is limited by Paragraph 561, Section 10, Title I of the Administrative Regulations of the Department of Agriculture and by the Federal Reports Act of December 24, 1942 (56 Stat. 1078). (This restriction does not apply to Survey field or office recording forms.) In essence this regulation and law require clearance by the Bureau of Agricultural Economics and the Bureau of the Budget before information on identical items may be solicited or collected from ten or more persons regardless of whether the solicitation is verbal, by phone, telegram, or mail. For full explanation see the statement on "Clearance of Questionnaires and Reporting Requirements" issued by the BAE in September 1945 and Regulation A - Federal Reporting Services - Clearance of Plans and Reports - Bureau of the Budget,

February 13, 1943, copies of which are in Appendix B. Clearance responsibility extends not only to use of forms but also to the procedures under which the form will be used, including sampling methods. Plans and forms should adhere to this regulation, and proposals should be submitted through the Chief's office of the Forest Service, not directly. In submitting plans and forms, send seven copies of the proposal. At least two months should be anticipated between time of submission and clearance of forms. Renewal of forms and plans previously approved require the same procedure. Requests for renewal should be accompanied by a statement fully justifying the renewal and describing any change in previously approved plans. Any change in a form, however minor, makes it a new form according to the Bureau of the Budget.

- 3.13 Inspection and supervision. Specifically the objectives of inspection and supervision within the Forest Survey project are: (1) to determine if work programs are adequate to meet most efficiently responsibilities as defined by the basic legislation and interpreted by this manual, (2) to insure that the work is conducted according to the program, and (3) to appraise Station efficiency in conducting the work and to determine if the best techniques are used.

The basic objectives of Forest Service inspection are defined in the Forest Service Manual, Volume I, Chapter GA-D. These should govern the functional inspections within the Forest Survey at both Washington and field levels. The Forest Service Manual provides that general functional inspections should be made by the Chief's office of Stations every two or three years. In the case of the Forest Survey this inspection would be made by the Chief, Division of Forest Economics or his assistants. No frequency is prescribed at the field level, but as a general rule work of field crews should be inspected by the Station Division Chief or principal assistant at least three times a year. In all cases inspection and supervision should conform to general Forest Service regulations and policies.

Although not specifically mentioned in the Forest Service Manual, the maintenance of communication and contact between all ranks of employees is a desirable objective of inspection and supervision. Inspection should be recorded in the manner prescribed in the Forest Service Manual.

- 3.14 Progress reports. Reports showing status and progress should be submitted semiannually in triplicate by the Stations, using the form in Appendix F and following the instructions given in Footnote 1, Section I of the form. The project status sheets requested in the attachment to Kotok's circular of June 14, 1948 (R-REPORTS, Project Status Sheets) will supply needed information on reports and a narrative description of future plans. However, a narrative statement on progress in techniques research should be included in the progress report unless adequately covered in the regular project status sheets.

Copies of the progress report form will be supplied by the Chief's office and should be requested two months in advance of the date needed.

- 3.15 Manual exceptions and revisions. Desired exceptions to the manual should be taken up with the Chief's office. Desired revisions should be proposed in terms of specific rewording, additions, or deletions. These will usually be circulated for comment to the Stations concerned before decision is reached.

3.2 Fiscal matters.

- 3.21 Regular appropriations. Normally the work of the Forest Survey is financed by so-called "regular" appropriations and as such is subject to the regulations as prescribed in the Forest Service Manual, Volume I, Chapter GA-F. Forest Survey appropriations are allotted by "initial" and "resurvey" categories in accordance with the basic legislation. Stations having allotments for both types of work should be sure such funds are used for the work intended.

In expending "regular" money the first responsibility is to satisfy the required and specified optional subject-matter items at manual standards. Additional coverage, greater intensity, or more frequent periodicity than specified in the manual ordinarily will be dependent upon money from other sources. As a general rule, use of regular Forest Survey money for actual flying costs of photographic projects will be limited to experimental purposes or to special situations (see 3.62).

- 3.22 Cooperative financing. Cooperative agreements should be approved by the Station Director and Regional Fiscal agent and need not be submitted to the Chief's office for prior approval unless they involve cooperation with the State Agricultural Experiment Stations, transfer of funds appropriated by the Federal Government, or change in arrangements subsequently specified for cooperative publication (see 3.41 and 4.35). The Chief's office, however, should be promptly furnished copies of all agreements made, and any supplementary information that is advisable.

- 3.3 Personnel. General rules for personnel procedure and policy are defined and specified in the Forest Service Manual, Chapter E. This section of the Forest Survey Manual will deal only with additional matters pertinent to conduct of the Forest Survey.

- 3.31 Recruitment. Within the framework of Forest Service and Civil Service procedure, attention should be given the special qualifications needed for Forest Survey personnel in field and office phases of the work.

- 3.32 Career ladders. Experience on the Forest Survey is definitely recognized as one of the rungs in the career ladder. Advancement may be within the Survey organization, to other research positions, or to positions in national forest administration, and State and Private Forestry. Ordinarily career employees will remain in the entrance P-1 position for a comparatively short training period in accordance with Forest Service policy as outlined in the Chief's

K(R)-PERSONNEL, Classification, letter of May 17, 1948, P.M. No. 48-68. At the conclusion of this training period, qualified incumbents should be promoted to a higher grade position within the Survey or transferred to positions of equal or higher salary level in other lines of work.

A fairly high rate of turn-over must be anticipated in the lower grade professional positions. Transfers to other research divisions, national forest administration, or State and Private Forestry should be encouraged if for the good of the Service and the employee. The Forest Survey is a complex technical job requiring a wide range of skills and hence a training ground for other Forest Service work. However, consideration of transfers should recognize the need for stability and continuity of Survey staffs. Personnel best qualified for Forest Survey careers should be given opportunity for broad experience; this may be done by on-the-job training, interstation transfers of Forest Survey personnel, and educational furloughs.

Opportunities for advancement within the Forest Survey organization are good for those with unusual qualifications in statistics, mensuration, photogrammetry, or analysis. In particular, there are exceptional opportunities and special need for personnel qualified to analyze resource data and skilled in interpretative writing.

- 3.33 Training. An efficient training program is vital to successful operation of the Forest Survey. In addition to training in statistical, photogrammetric, and other techniques used in the Forest Survey, the usual Forest Service orientation training should be given. Advantage should be taken of regional office and Washington office facilities for training. Information on training programs and problems should be exchanged freely between Stations.
- 3.34 Safety and welfare. The relatively hazardous and isolated nature of Forest Survey work requires special emphasis upon personnel safety and welfare. All reasonable precautions should be taken against occupational injuries and illness. Special attempts should be made to encourage Forest Survey field personnel in maintaining professional contacts and in integrating them into the Forest Service organization as a whole. The mobile nature of the Forest Survey work creates problems in living conditions for field personnel which should be recognized in work planning.
- 3.4 Cooperation. The House Committee on Agriculture, 81st Congress, 1st session, in Report No. 451 on H.R. 2001 states: "Section 9 of the McSweeney-McNary Act directs the Secretary of Agriculture in conducting the forest survey 'to cooperate with appropriate officials of each of the United States,'... 'under such plans as he may determine to be fair and equitable'." The Committee further stated: "The financial cooperation which the Secretary has required of the States in this survey has been insignificant," and "It seems to the committee

that the Secretary might determine that a 'fair and equitable' State share of the cost is considerably more than most States have contributed in the past or are presently estimated as contributing in the future."

It is the policy of the Forest Survey to aggressively seek cooperation from States and other agencies and Survey programs should be designed to encourage it. Regular Forest Survey funds should be devoted to satisfying manual specifications, including specified optional items. Greater speed, additional subject-matter coverage, or greater intensification ordinarily can be undertaken only if cooperative assistance is available.

This section deals with general cooperative relationships with other public agencies, private individuals and concerns, and other divisions and branches of the Forest Service. The fiscal aspects of agreements involving cooperative financing have been specified previously (3.22).

- 3.41 Cooperative publications. The Chief's letter of March 1, 1946, (I-PUBLICATIONS, Production) states the policy regarding cooperative publications. (Also discussed in 4.35.) It states: "Prior approval of the Chief's office should be secured before printing of such a publication (one devoted entirely to the findings of intensive research by the Forest Service) is done outside the Government." This letter was directed toward printing of reports. Publication of maps, such as Forest Survey type maps, was not covered. Circumstances might make cooperative publication of type maps or Survey reports advantageous, and this possibility should be considered. However, before commitments are made, proposals should be submitted to the Chief's office for approval.

- 3.42 Cooperation - other public agencies. As a general rule cooperative projects with other Federal agencies, such as the Bureau of the Census and the Bureau of Agricultural Economics, should be submitted to the Chief's office for approval prior to initiation of work. This does not apply to informal cooperation and exchange of information between field offices of Federal agencies.

Cooperative projects with nonfederal public agencies, such as States and counties, do not require prior approval of the Chief's office unless a major change in work programs or methodology is involved and except as indicated in 3.22.

Cooperation with other divisions and branches of the Forest Service is expected as a normal part of Service-wide policy. Coordination and integration of Forest Survey techniques with those of Timber Management and Forest Management Research are particularly important. The Regional Foresters-Directors meeting of March 22-27, 1948 concluded that: "There should be close integration in methodology between the Forest Survey and NFA Timber Management surveys, but the Forest Survey is not a substitute for national-forest timber-management surveys and intensification to that extent is not desired."

- 3.43 Cooperation - private concerns. The same principles govern such cooperation as in cooperation with State and county agencies. In undertaking special jobs for private concerns, caution should be exercised that efforts are not diverted from the public objectives of the Survey, that the impartial position of Survey findings is not weakened, and that the legitimate field of private forestry consultants is not invaded.
- 3.44 Requests for special information. Requests for information requiring undue diversion of Survey effort from the specified objectives should either be refused or handled upon a reimbursable basis. A major objective of the Forest Survey is to have its findings used, but finances are limited and little tolerance is available for undertaking expensive special assignments. Each case will have to be decided upon its merits. See 3.513 for more details.
- 3.5 Technical operations and procedures. This section deals with operational procedures and standards directly related to meeting subject-matter specifications.
- 3.51 Priority of required and optional items. Chapter 2 explains required subject-matter items. At times it was necessary in that Chapter to outline operational procedure in order to explain the subject matter adequately.
- 3.511 Required items. Satisfaction of the required subject-matter items at specified standards and periodicity is the first responsibility of the Forest Survey.
- 3.512 Optional items. The list of optional items in Chapter 2 was purposely kept to a minimum. If any are to be obtained those shown are of highest priority. These optional items should be obtained only if required items can be satisfied, the future Forest Survey program (both field and report scheduling) provided for in budgeting of funds, and the extra effort will not impinge upon the current report program. Other optional items ordinarily will require cooperative financing and may be added at the Stations' discretion, provided they are compatible with the general objectives and policies of the Forest Survey.
- 3.513 Special requests. It is recognized that service jobs or requests for specialized information regarding forest resources is a legitimate function of the Forest Survey. Many of these can be filled as a routine procedure through correspondence or reference to Forest Survey publications. Other requests require special compilations involving a considerable amount of time and might interrupt the regular work schedule. They should not be undertaken unless there is sufficient latitude in the regular program; or unless they can be handled on a reimbursable basis. See 3.44.

- 3.52 Survey systems. Systems currently used are not necessarily final and continued study should be given to their improvement and to development of new systems. Major study of objectives include: (1) greater flexibility to encourage cooperation; (2) reduction of costs; (3) increased accuracy; and (4) simplification of growth, mortality, and drain procedures.

The "bookkeeping" system in which growth and drain estimates are applied to original inventory data to adjust volume figures to any given time (although sound in theory) has been proved unreliable in practice and becomes less reliable the longer the time lapse since the original field inventory survey. An alternative system, the "continuous inventory" will be tested experimentally under both eastern and western conditions. This system is roughly analogous to that used in some European countries in that it relies on frequent or continuous reinventories in lieu of application of growth and drain data to original inventory estimates. If the continuous inventory system or an adaptation of it proves more efficient, less costly, and more reliable than the bookkeeping system, it will gradually replace the latter.

- 3.53 Unit of area. The primary unit of area for subject-matter coverage, for which sampling standards will be described and for which findings will be reported and published, will be the State. In a few cases exceptions, as described in 4.211, may be made because the State is too large or too small in forest land area to serve these purposes satisfactorily. In such cases the State may be subdivided or two or more States combined. When a State is divided between two Stations the work should be coordinated by the Stations involved, especially the scheduling of field work and preparation of State reports.

Control areas on which to base sampling standards, catastrophic mortality, or minimum type areas, should be honestly and impartially selected in order that the intent of the manual instructions be carried out; there should be no gerrymandering of areas to avoid the intent of the manual.

- 3.54 Intensity of Survey and sampling standards. There is valid justification for variation in intensity of Survey as financed from Federal funds between regions. On the other hand, some interregional standards are essential to satisfy national aspects of the Survey and to facilitate program control. These standards include definition of terms, subject-matter coverage, and sampling specifications for a few (5) selected major volume and area items. Stations have complete latitude to establish their own sampling standards within the prescribed limits and for other items. Even the specified items have varying standards between Stations in recognition of different regional conditions and needs. Calculation of sampling errors is necessary only to the extent needed to meet requirements of Appendix C or the following table:

Requirements for sampling errors

Type of Survey	Station	Sampling error in terms of 1 standard error				
		Volume	Commercial forest	Noncomm. forest	Drain	Growth
		1/ Percent	2/ Percent	3/ Percent	4/ Percent	5/ Percent
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Initial	NE	5	3	10	5	5
	CS	5	3	10	5	5
	SS	5	3	10	5	5
	CAL	10	3	10	10	10
	NRM	10	3	10	10	10
	R-2, 3, 4	12	3	10	12	12
Resurvey	SS	5	3	10	5	5
	SE	5	3	10	5	5
	LS	5	3	10	5	5
	PNW	10	3	10	10	10
	NRM	10	3	10	10	10

- 1/ Per 1 billion cubic feet of growing stock on commercial forest land. Error to be achieved as closely as practicable.
- 2/ Per 1 million acres of commercial forest land. This is maximum allowable error.
- 3/ Per 1 million acres of noncommercial forest land. This is maximum allowable error.
- 4/ Per 1 billion cubic feet of annual commodity drain on growing stock on commercial forest land. Error to be achieved as closely as practicable.
- 5/ Per 1 billion cubic feet of net annual growth of growing stock on commercial forest land. This is maximum allowable error.

The above figures apply only to sampling errors but every reasonable effort should be made to minimize other types of errors. Detailed statistics should be published only when errors are considered reasonable.

3.55 Periodicity of surveys.

3.551 Inventory, growth, and drain. Periodicity of surveys is one of three major factors controlling Forest Survey work, the other two being subject-matter coverage and sampling standards. If funds are insufficient to satisfy standards for all three factors, sacrifice

periodicity goals first. The frequency or periodicity goals of surveys vary between and within regions and should be based primarily on the rate of change in forest-resource conditions. The range in periodicity should be from 5 to 20 years and for the country as a whole should average about 10 years. Within Station boundaries, Stations should select their own periodicity goals subject to the objective of resurveying their territory on the average as follows:

Southern and Southeastern Stations - 7 years

Central States, Lake States,)
Northeastern, California, and) - 10 years
Pacific Northwest Stations)

Northern Rocky Mountain Station - 13 years

Intermountain, Rocky Mountain,)
and Southwestern Stations) - 15 years

In addition, timber products cut and commodity drain should be estimated every 5 years because of the value of this information as independent statistics. This is predicated on the assumption that Census Bureau surveys will continue on about the same magnitude and frequency as in recent years and that the Census Bureau will supply commodity production figures for the principal "manufactured" products. There should be no duplication of Census Bureau work.

Annual or biennial Census surveys of production may provide an opportunity for office estimation of commodity drain at shorter intervals. This should be an office job and a minimum of effort should be expended on refining such data. No annual or biennial drain field surveys are contemplated with Federal Forest Survey funds.

3.552 Survey "bookkeeping" and reappraisal. Experience has shown that annual or periodic calculation of forest inventories through adjustment of previous inventories by application of growth and drain data is unsatisfactory except in special cases. This will not be a regular Survey technique.

Periodically requests may be made for information on forest resources for use in national appraisals of the forest situation. This would require inventory, growth, and drain data as of a common date and would inevitably be an office "bookkeeping" process.

- 3.56 Standard drain units and conversion factors. The following list of timber products and standard units has been selected as a minimum list for classification of production and commodity drain.

<u>Timber products</u>	<u>Standard units</u>
Sawlogs (for lumber, timbers, and sawn ties)	Board feet, Int'l. $\frac{1}{4}$ -inch rule
Veneer logs and bolts	Board feet, Int'l. $\frac{1}{4}$ -inch rule
Cooperage logs and bolts	Board feet, Int'l. $\frac{1}{4}$ -inch rule
Pulpwood logs	Board feet, Int'l. $\frac{1}{4}$ -inch rule
Pulpwood bolts	Standard cords (rough wood)
Fuel wood	Standard cords (rough wood)
Piling	Linear feet
Poles	Pieces
Posts (round, split)	Pieces
Hewn ties	Pieces
Round mine timbers	Cubic feet
Miscellaneous products ^{1/}	Cubic feet

Under the continuous inventory system items other than sawlogs, veneer logs and bolts, and pulpwood may be grouped in table 10.

Each Station should determine regional converting factors, fully define them, and explain the basis for their derivation and use in their drain working plans or field manuals.

- 3.57 Map standards. Required forest type maps and types to be shown thereon are specified in 2.2. Requirements regarding publication are covered in 4.5. Standards of cartographic accuracy as respects forest types are not feasible in maps which require a large amount of generalization from detailed data. The base map used, however, should be standard as to cartography, as specified in the Forest Service manual and also as to scale as specified in 2.2.

For the generalized maps required of all regions type legends should be standard. This applies to maps published in Washington or locally. Colors will, as nearly as possible, be those shown in the color legend in Appendix E. Where subtypes are of local importance they may be shown by stippling or other marking over the specified color for the major type. In submitting maps to Washington types should be shown by the appropriate numbers appearing in the color legend. All forest land reserved from commercial timber use should be hatched in black over the type colors. Areas less than 10 percent forested will be shown as "nontyped" rather than "nonforest."

^{1/} Stations may choose to show timber products in this group (such as chemical wood, shingles, split products, excelsior, etc.) separately when they are of regional importance.

Type color legends for local detailed type maps should harmonize insofar as possible with the basic color pattern for the generalized maps.

- 3.58 Techniques research. Opportunities for greater efficiency through improvement in techniques should be continuously explored. Reduction of nonsampling errors will appreciably increase the absolute accuracy of Survey data. Improvements can be accomplished partly through proper supervision, accumulated experience, and through taking full advantage of past and new work in forestry and allied fields. In other instances systematic research in techniques may be necessary. In particular, techniques research in the continuous inventory system, volume tables, cull estimation, photogrammetry including photo mensuration, and determination of mortality and growth, should be encouraged. It is not possible to establish a precise criterion for expenditure of regular Forest Survey funds for such purposes. Circumstances vary from region to region. Obviously, such projects should not be undertaken unless the anticipated saving within a few years, in cost of Survey operation, at least equals the expenditure for techniques research. As a general rule, Stations should not expend annually more than 2-1/2 percent of their regular Forest Survey allotment for this work without prior approval of the Chief's office.

All plans for techniques research should be sent the Chief's office for information and interregional coordination and progress should be reported in a narrative supplement to the semiannual progress report (see 3.14), or in the regular project status sheets. Results should be sent the Chief's office and other Stations conducting Forest Surveys.

- 3.59 Definitions. The definitions given alphabetically in Appendix A were prepared specifically for Forest Survey use. The objective in composing these definitions was to express precisely the meaning of the term as applied to conduct of the Forest Survey. The definitions explain the entire underlined term, not individual key words in it. Many of the terms listed have not been defined previously, or in such general and ambiguous manner as to result in loose usage. However, when existing definitions were found suitable they were used in toto or in substance.

Appendix A repeats with identical wording all definitions appearing in Chapter 2. If discrepancies in wording should be found, notify the Chief's office. Appendix A also includes definitions of other terms used in Chapter 2 but not defined there for simplicity of reading

The definitions included in Appendix A should be used as worded, rather than paraphrased, in Forest Survey practice and publications in order to avoid confusion.

- 3.6 Procedure regarding aerial photographs. The extensive use of aerial photographs in Forest Survey work has created problems which merit special attention.
- 3.61 Procurement of prints from existing photography. Film in the hands of Federal agencies is scattered in location. Circular E-3315, E-PHOTOGRAPHY, General, of May 6, 1948, addressed to Regional Foresters and Directors gives information on location of SCS and P&MA film. Circular E-3248, E-PHOTOGRAPHY, General, of April 14, 1947, addressed to Directors, All Eastern Stations, gives detailed instructions for requisitioning photo prints through the Forest Service photographic laboratory. The Forest Service Manual, Volume 3, NF-16, gives standard procedure for use of Forest Service film also.

Following is a digest of procedure, including general principles, that should be followed:

- a. Anticipate needs well in advance.
- b. Set up priorities by counties so that if top priority film is not immediately available, work may progress.
- c. Prints of film belonging to Government agencies and stored in Washington should be requisitioned through the Chief's office, using Form 988 as instructed in the Forest Service Manual.
- d. Prints of Government film stored outside Washington should be requisitioned through Forest Service regional engineering offices.
- e. Procurement of prints of private film may be arranged directly between the Stations and owners, but should be conducted in accordance with regular procurement regulations and the Forest Service Manual.

Following are locations of Government film insofar as is known:

Forest Service film is stored at regional offices except for Regions 3, 7, 8, and 9, which is stored in Washington.

Soil Conservation Service film is all stored in Washington.

Production and Marketing Administration film is stored in Washington except for that covering North Dakota, Kansas, and all States west of the 102nd Meridian, which is stored in Salt Lake City.

Geological Survey film is stored in four places: Sacramento, California; Denver, Colorado; Rolla, Missouri; and Washington, D. C. For full particulars see circular E-3349 dated January 27, 1949 (E-PHOTOGRAPHY-General) addressed to Regional Foresters and Directors.

Coast and Geodetic Survey film is stored in Washington.

Armed Services films are supposed to be stored in Washington. It is not uncommon to find Armed Services film located outside Washington.

- 3.62 New Aerial photography. Whenever new aerial photography is undertaken by the Forest Survey, principally on cooperative projects, the Department regulations covering such work will govern. The first step consists of obtaining technical approval of the Department, the procedure for which is covered in the Forest Service Manual, NF-L-2-page 2. Copies of the prescribed mimeographed form--Application for Aerial Photography--can be obtained from regional engineering offices or from the Washington office. These forms are to be submitted through the Chief, Forest Service. A check should be made to be sure no other photography is available. Leaving of small gaps between proposed and existing photography should be avoided insofar as practicable. If existing Government coverage is available but deemed inadequate, a statement fully justifying the recoverage should accompany the application. Procurement of the new photography should follow the procedures in Administrative Regulations, U.S.D.A. Title 5, Section 202-a-(2)-(b), page 124.

- 3.7 Requirements. The requirements phase of the Forest Survey is not covered in this manual. Requirements studies are conducted mainly on a national basis by the Chief's office, and consequently the need for manual instructions does not exist. This omission should not be construed as minimizing the importance of requirements work which probably impinges more directly on forest policy than any other phase of the Survey.

Stations will be asked to assist in field aspects of national requirements studies, and in most instances will finance such assistance from regular Survey allotments even though this causes curtailment of progress in other Survey phases.

Station proposals for regional requirements studies should be cleared on an individual basis with the Chief's office prior to initiation of work.

4.0 Publication of findings. The basic principle of Forest Survey publications is to obtain prompt and effective use of information resulting from the Survey. Several different types of publications are required to serve adequately the needs of the wide and varied audience.

4.1 Standard tables. Tables 1 through 10 in Appendix D standardized as to format and content are to be included in each State and subregional statistical and analytical report, usually in a group at the back of the report. There should be no deviation in terminology or headings. Additional detail may be shown provided the titles, captions, and format of the tables are not changed. If an occasional item called for in the tables is of insufficient reliability to justify publication, combine with related items and explain by footnote.

Obviously a set of tables cannot be designed to give each Station the opportunity to emphasize items of regional or local importance. The purpose of requiring these tables is to provide readers an opportunity for comparing and combining comparable data for large areas. Stations have full discretion for including whatever additional tables they consider necessary.

Tables 11 and 12 should not be published without prior Chief's office approval.

4.2 Statistical reports.

4.21 State and subregional.

4.211 Area covered. Statistical reports are required for each State except Connecticut, Rhode Island, Delaware, New Jersey, Iowa, Kansas Nebraska, North Dakota, and Nevada. If data for the above States prove reliable, separate reports should be published, otherwise data should be issued in combination with adjoining States at the Stations' discretion. Timing of the work and issuance of reports for States within territory of two Stations should be governed by the Station having the largest portion of the State's forest area.

Statistical reports are required for the following subregions: the Mississippi delta, the redwood subregion of California, the Douglas-fir subregion of Oregon and Washington, and the ponderosa pine subregion of Oregon and Washington. Other subregions may be designated by the Stations: for example, northern Lake States, and naval stores subregion.

4.212 Contents. In addition to the standard tables, each report should contain a brief foreword describing the nature and scope of the survey. Description of sampling methods used and nature and accuracy of data presented should be included and conform to "Standards for the Publication of Statistical Data" (Appendix C). Definitions used in statistical reports should agree with the definitions in this Manual. Each report should contain a comparison of the principal statistics with similar data from the Reappraisal or previous Forest Survey releases and adequate explanation should be made of any significant differences to avert misinterpretation of either the previous figures or any differences that may occur. If the

comparisons reveal differences that are properly attributable to differing standards, definitions, and techniques, this should be explained. If the differences are the result of actual changes in forest conditions, this also should be explained. Differences may be due to a combination of the above factors or may simply result from the fact that previous figures were not reliable. Explanations should consider all relevant conditions.

A brief text describing the nature and significance of the statistical material should be included.

- 4.213 Publication and review procedure. Statistical reports should be processed by the Stations and issued within nine months after completion of the field work in the area. When each State or sub-regional statistical report is completed, two copies of the report should be transmitted to the Chief accompanied by a draft of a proposed press release. After review and approval, the press release will be given an advance date by the Washington Office and returned to the Station and Region in time for joint release by all Forest Service offices. Prior to the date of the press release, no copies of the report shall be distributed.

- 4.22 County and county group reports. Statistical reports for counties or groups of counties are not required, but their publication is desirable if data are available and demand exists. Text and tables may take the form the Station elects. Review by the Chief's office is not required.

If Reappraisal or previous Survey data have been released for the area covered by these reports, comparison of new findings with previous figures, and explanation of differences arising should be made as required in 4.212.

The issuance of a series of county or county group reports covering the entire State should not be considered as fulfilling the requirement of a State statistical report, 4.211. The final county or county group report of a series may be issued under the same cover with the State report or simultaneously with it, whichever the Station elects.

If the Station decides that a county or county group report contains findings that are of outstanding significance or that might be subject to misinterpretation, a press release should be prepared and forwarded to Washington for action as provided in 4.213 for State and sub-regional reports.

4.3 Analytical reports.

- 4.31 Description. Printed reports containing a comprehensive analysis of the forest situation in the area, based upon Forest Survey findings supplemented by additional pertinent information that can be obtained from secondary sources.

- 4.32 Area covered. Analytical reports are required for each State, combination of States, and subregions for which statistical reports are issued under 4.211.
- 4.33 Contents. The condition of the forest land and timber resource and its significance to the area economy should be the object of primary emphasis. Each report should include a summary, discussion of all the following major subject-matter topics, and conclusions and recommendations. It should also include in appropriate places, a comparison of principal statistics with previous figures from the Reappraisal or earlier Survey releases and explanation of any differences that occur as required in 4.212. The significance of each subject-matter item obtained under Chapter 2 should be considered in preparation of the report. Discussion need not follow the order given here, title heads may be altered to emphasize important local aspects, treatment of a particular subject may vary to fit conditions, and topics may be combined into chapters or treated separately, but the treatment should be complete and balanced. A concluding paragraph or paragraphs at the end of each chapter may be used to point up the discussion of each major topic.

It is not intended that other forest resources such as water, forage, and wildlife, will be treated comprehensively because the Forest Survey at present is emphasizing timber resources. They may, however, be given brief general treatment under 4.333 and in other sections where they relate directly to the timber economy.

- 4.331 Foreword. A concise statement of the purpose and scope of the Forest Survey, regionally and nationally. Acknowledgments should be included here.
- 4.332 High light summary. A brief summary of the facts, conclusions, and recommendations that deserve emphasis.
- 4.333 General description of the State or subregion. A short general description of the physical, economic, and social characteristics of the area, particularly as related to the timber resources and industries. Include reference to other forest resources.
- 4.334 Forest land and timber resource. A description of the forest land and timber inventory in its present condition. Required inventory subject-matter items should be presented here, if relevant. Text tables may be useful in pointing out important statistical details of the resource. Trends in the condition of the resource may be shown by comparison when data from previous inventories are available.

This chapter should go beyond a mere recital of conditions found by the Survey. It should isolate and emphasize the conditions which need correction or which govern or strongly influence drain, growth, or timber industries. Premature conclusions should be avoided, however, and in general recommendations should be reserved for later presentation when more facts are available to the reader.

- 4.335 Trends in timber volume. This chapter should correlate the data presented on inventory, growth, mortality and drain. It should cover timber volume and growth goals, should review past trends, project them into the future, and set the stage for the discussion of timber industries.
- 4.336 Timber industries in relation to timber supply. A description of the timber industries, their nature, and size with particular reference to their impact upon the forest land and timber resource. Important industries should be treated individually. Adequacy of the timber supply to sustain a stable economy should be analyzed.
- 4.337 Ownership. Consider ownership of forest land and timber. Relate forest type, stand-size class, and condition to such factors as kind and size of ownership, length of tenure, method of acquisition, primary use, and future intent of owner. The effect of ownership on forest management and condition is so pronounced that ownership data should be analyzed to the fullest possible extent. Stations having made special ownership studies, either independently or in cooperation with other agencies, should present this subject in detail.
- 4.338 Conclusions and recommendations. This is the most important chapter of the report, and should be the final interpretation of Survey facts concerning forest land and timber resource. The chapter should consist of conclusions, each supported by a narration of the reasoning from facts to conclusion; and recommendations, each with a narration of the reasoning from conclusions to recommendation. Conclusions and recommendations should be clear-cut and positive statements predicated upon analysis of factual material included in the report. Do not include conclusions or recommendations based on information not embodied in the report. In general, recommendations should indicate physical needs and broad remedial measures but should not recommend legislative or political action.
- 4.339 Appendix. Include details of technique, description of sampling standards, standard tables, definitions, and other material of primary interest to the technician.
- 4.34 Sources of data. Sources other than original Forest Survey data will have to be used for timber industries, economic conditions, and similar subjects. All such data should be documented and acknowledged.
- 4.35 Publication and review procedure. Analytical reports will be issued by the Government Printing Office as printed Departmental publications. Under some circumstances cooperative printing with State or other public agencies may be permitted or encouraged, but, in general, it is Forest Service policy to publish results of major research through Departmental channels. Forest Service policy regarding cooperative publications is stated in 3.41. The Forest Service Manual, Volume 1, G-A-50-18, gives detailed instructions regarding cooperative publications.

Review and publication procedures should conform to "Research Publication Policy and Procedure," dated January 1947. Cooperative publications should be submitted to the Chief's office for review and approval in the same manner as Departmental publications. Press releases for each analytical report should be submitted as stated for State statistical reports in 4.213.

Analytical reports should be completed and submitted to the Chief's office in manuscript form for publication within one year after completion of field work in a State or subregion regardless of form of publication.

- 4.4 Special reports. A confidential brief supplement, designed for in-Service use only, is desirable in connection with each comprehensive analytical report for a State or subregion. It should contain suggestions for specific program needs deemed unsuitable for inclusion in the published reports but of value in formulation of broad regional or Service-wide policies and programs. Three typed copies should accompany the analytical report when it is submitted to the Chief's office. One should be sent the Regional Forester.

Other special reports are optional with the Stations but are highly desirable. Their preparation, however, should not interfere with the regular report program. In many cases they can be scheduled at times when work on required reports is not heavy or assigned to staff men, other than those assigned to regular report programs, either as training or to use their specialized experience.

These reports will vary by type and method of release. Examples are:

- a. Presentation of more detailed aspects of inventory, growth, drain, or ownership than are given in the regional and State reports.
- b. Reports of results of techniques research or Survey techniques.
- c. Volume tables or other working data.

In general, special reports should be printed except for confidential in-Service supplements. They may be articles for the Journal of Forestry, other scientific journals, trade journals, or the press. Articles not acceptable nor suitable for printing may be issued as Station processed reports. Chief's office review is not required, except for Departmental publications.

- 4.5 Maps. Required generalized type maps, scale 1 inch equals 40 miles, should be transmitted to Washington on tracing cloth as soon as completed for combination into a map of the United States. Specifications for their preparation are given in sections 2.21 and 3.57 and Appendix E.

Each printed analytical report should include a State or subregion generalized type map at either a 1-inch-equals-40 miles scale, or larger. Method and type of publications for required detailed type maps are optional with the Stations.

APPENDIX A -- FOREST SURVEY DEFINITIONS

(See 3.59)

Contents

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Areas

Area reserved from commercial timber use. Forest land withdrawn from timber utilization through statute, ordinance, or administrative order, but which otherwise qualifies as commercial forest land.

Area unproductive for timber use. Forest land incapable of yielding usable wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Chaparral land area. Lands supporting heavily branched dwarf trees or shrubs, usually evergreen, the crown canopy of which covers more than 50 percent of the ground and whose primary value is watershed protection. The more common chaparral constituents are species of Quercus, Cercocarpus, Garrya, Ceanothus, Arctostaphylos, and Adenostoma. Types dominated by such shrubs as Artemisia, Opuntia, Purshia, Gutierrezia or semidesert species are not commonly considered chaparral.

Commercial forest land area. Forest land which (a) is producing, or physically capable of producing, usable crops of wood (usually saw timber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Forest land area. Includes (a) lands which are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which have not been developed for other use; (c) afforested area; and (d) chaparral areas.

Areas (continued)

Nonforest land area. Land that does not qualify as forest land.

Noncommercial forest land area. Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land and (b) incapable of yielding usable wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Stand size classes

Large young-growth saw-timber stands. Young-growth saw-timber stands having more than 50 percent of the net young-growth board-foot volume in large young-growth saw-timber trees.

Nonstocked and other areas not elsewhere classified. Areas not qualifying as saw-timber, pole-timber, or seedling and sapling stands.

Old-growth saw-timber stands. Saw-timber stands in which over 50 percent of the net board-foot volume is in old-growth saw-timber trees.

Pole-timber stands. Stands failing to meet the saw-timber stand specification, but at least 10 percent stocked with pole-timber and larger (5.0" d.b.h. and larger) trees and with at least half the minimum stocking in pole-timber trees.

Residual old-growth saw-timber stands. Old-growth saw-timber stands that have been materially changed by cutting.

Saw-timber stands. East of 100th Meridian: Stands with saw-timber trees having a minimum net volume per acre of 1,500 board feet, International 1/4 inch-rule. West of the 100th Meridian: Softwood stands with saw-timber trees (both softwoods and hardwoods) having a minimum net volume per acre of 4,000 board feet, International 1/4-inch rule, in the westside Sierra pine, coast range pine and Douglas-fir, and redwood subregions of Region 5, and the Douglas-fir subregion of Region 6; 1,500 board feet per acre in Regions 1, 2, 3, 4, the eastside Sierra pine subregion of Region 5, and Ponderosa pine subregion of Region 6; and hardwood stands of 1,500 board feet (both hardwoods and softwoods) per acre in all regions west of the 100th Meridian.

Seedling and sapling stands. Stands not qualifying as either saw-timber or pole-timber stands, but having at least 10 percent stocking of trees of commercial species and with at least half the minimum stocking in seedling and sapling trees.

Areas (continued)

Small, young-growth saw-timber stands. Young-growth saw-timber stands having 50 percent or more of the net young-growth board-foot volume in small young-growth saw-timber trees.

Virgin old-growth saw-timber stands. Old-growth saw-timber stands that have not been cut, or have been cut so lightly as not to make any material change in the original forest canopy or quality of the original stand.

Young-growth saw-timber stands. Saw-timber stands in which 50 percent or more of the net board-foot volume is in young growth saw-timber trees.

Stocking. Stocking is the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. "Degree of stocking" is synonymous with "percent of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Stocking may be measured in terms of number of trees, volume, basal area, cover canopy, or other criterion, or combination of criteria.

Nonstocked area. Areas that are 0 to 10 percent stocked with present or potential growing stock trees.

Poorly stocked stands. Stands that are 10 to 39 percent stocked with present or potential growing stock trees.

Well- and medium-stocked stands. Stands that are 40 percent or more stocked with present or potential growing stock trees.

Total land area. Includes dry land and land temporarily or partially covered by water, such as marsh land, swamps, and river flood plains (omitting tidal flats); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile in width; and lakes, reservoirs, and ponds having less than 40 acres of area.

Ownership

County and municipal. Lands in county or municipal ownership.

Farm. Private commercial forest land in farms, using as the definition of "farm" the official definition in the latest Census of Agriculture.

Indian. Indian tribal lands and trust allotments, i. e., lands held in fee by the Federal Government but administered and managed for Indian tribal groups or allotted in trust to individual Indians.

National forest. Federal lands which, by executive order or statute, have been designated as national forests, purchase units, or experimental areas or have been placed under the administration of the Forest Service.

Ownership (continued)

Other Federal. Lands owned by the Federal Government not classed as national forest, Indian, or State.

Other private. Commercial forest land in private ownership other than farm.

Private. Land in private ownership.

State. Lands in State ownership or lands under lease to States for 50 years or more.

Forest Types

Major types called for in 2.11113 and 2.2 will be determined upon the basis of predominant species as indicated by cubic volume for saw-timber and pole-timber stands, and number of trees for seedling and sapling stands. Where none of the indicated species comprise 50 percent or more of a given stand, the stand should be typed on the basis of plurality of cubic volume or number of trees. The major types defined below are applicable to commercial forest land and areas reserved from commercial timber use. All local types will be keyed to these major types.

Western types

1. Douglas-fir: Forests in which 50 percent or more of the stand is Douglas-fir. (Common associates include western hemlock, western red cedar, the true firs, redwood, ponderosa pine, and larch.)
2. Hemlock-Sitka spruce: Forests in which 50 percent or more of the stand is western hemlock and/or Sitka spruce. (Common associates include Douglas-fir, silver fir, and western red cedar.)
3. Redwood: Forests in which 50 percent or more of the stand is redwood. (Common associates include Douglas-fir, grand fir, and tan oak.)
4. Ponderosa pine: Forests in which 50 percent or more of the stand is ponderosa pine. (Common associates include Jeffrey pine, sugar pine, limber pine, Arizona pine, Apache pine, or Chichuahua pine, Douglas-fir, incense cedar, and white fir.)
5. Western white pine: Forests in which 50 percent or more of the stand is western white pine. (Common associates are western red cedar, larch, white fir, Douglas-fir, lodgepole pine, and Engelmann spruce.)
6. Lodgepole pine: Forests in which 50 percent or more of the stand is lodgepole pine. (Common associates are alpine fir, western white pine, Engelmann spruce, aspen, and larch.)
7. Larch: Forests in which 50 percent or more of the stand is western larch. (Common associates are Douglas-fir, grand fir, western red cedar, and western white pine.)

Forests Types (continued)

8. Fir-spruce: Forests in which 50 percent or more of the stand is true fir (*Abies* spp.), Engelmann spruce, or Colorado blue spruce, singly or in combination. (Common associates are mountain hemlock and lodgepole pine.)
9. Pinyon pine-juniper: Forests in which 50 percent or more of the stand is pinyon pine and/or juniper. (Cypress is a common associate.)
10. Hardwoods: Forests in which 50 percent or more of the stand is aspen, red alder, or other western hardwoods, singly or in combination.

Eastern types (East of Rocky Mountains)

11. White-red-jack pine: Forests in which 50 percent or more of the stand is eastern white pine, red pine, or jack pine, singly or in combination. (Common associates include hemlock, aspen, birch, and maple.)
12. Spruce-fir: Forests in which 50 percent or more of the stand is spruce or true firs, singly or in combination. (Common associates include white cedar, tamarack, maple, birch, and hemlock.)
13. Longleaf-slash pine: Forests in which 50 percent or more of the stand is longleaf or slash pine, singly or in combination. (Common associates include other southern pines, oak, and gum.)
14. Loblolly-shortleaf pine: Forests in which 50 percent or more of the stand is loblolly pine, shortleaf pine, or other southern yellow pines excepting longleaf or slash pine, singly or in combination. (Common associates include oak, hickory, and gum.)
15. Oak-pine: Forests in which 50 percent or more of the stand is hardwoods, usually upland oaks, but in which southern pines make up 25 - 49 percent of the stand. (Common associates include gum, hickory, and yellow-poplar.)
16. Oak-hickory: Forests in which 50 percent or more of the stand is upland oaks or hickory, singly or in combination, except where pines comprise 25 - 49 percent in which case the stand would be classified "oak-pine." (Common associates include yellow-poplar, elm, maple, and black walnut.)
17. Oak-gum-cypress: Bottomland forests in which 50 percent or more of the stand is tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, except where pines comprise 25 - 49 percent in which case the stand would be classified "oak-pine." (Common associates include cottonwood, willow, ash, elm, hackberry, and maple.)

Forest Types (cont'd)

18. Elm-ash-cottonwood: Forests in which 50 percent or more of the stand is elm, ash, or cottonwood, singly or in combination. (Common associates include willow, sycamore, beech, and maple.)
19. Maple-beech-birch: Forests in which 50 percent or more of the stand is maple, beech, or yellow birch, singly or in combination. (Common associates include hemlock, elm, basswood and white pine.)
20. Aspen-birch: Forests in which 50 percent or more of the stand is aspen, balsam poplar, paper birch or gray birch, singly or in combination. (Common associates include maple and balsam fir.)

Volumes

(See section on "Areas" for "stand-size classes" and "stocking")

All-timber volume: Net volume in cubic feet of live and salvable dead saw-timber trees and pole-timber trees of commercial species, and cull trees of all species from stump to a minimum 4.0-inch top inside bark. Includes bole only of softwoods but both bole and limbs of hardwoods to a minimum 4.0-inch diameter inside bark.

Commercial species: Tree species considered in determining stocking and growing stock. Includes species presently or prospectively usable for commercial timber products; excludes so-called weed species such as sassafras, hawthorn, ironwood, etc.

Cull trees: Live trees of saw-timber or pole-timber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species.

Rotten cull trees: Live trees of saw-timber or pole-timber size which fail to meet regional specifications of proportion of sound volume to total volume.

Sound cull trees: Live trees of saw-timber or pole-timber size which meet regional specifications of freedom from rot but will not make at least one merchantable sawlog now or prospectively according to regional specifications because of roughness, poor form, or species.

Growing stock: Net volume in cubic feet of live saw-timber trees and live pole-timber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

Growing stock required to sustain current level of commodity drain: The minimum live saw-timber volume and growing stock volume on commercial forest land required to sustain permanently the levels of commodity drain during a specified year.

Volumes (cont'd)

Hardwood limbs: Limbs of live hardwood saw-timber trees and saw-timber size cull hardwood trees to a minimum diameter of 4.0 inches inside bark.

Large young-growth saw-timber trees: Young-growth hardwood and softwood saw-timber trees 15.0 inches d.b.h. and larger east of 100th Meridian and 21.0 inches d.b.h. and larger west of the 100th Meridian.

Live all-timber volume: Net volume in cubic feet of live saw-timber trees and live pole-timber trees of commercial species and cull trees of all species.

Live saw-timber volume: Net volume in board feet, International 1/4-inch rule, of live saw-timber trees.

Log grades: (See page 50)

Merchantable top: The point on the bole of saw-timber trees above which a minimum merchantable sawlog, as defined regionally, cannot be produced.

Net volume: Gross wood volume less deductions for rot or defect.

Old-growth saw-timber trees: Saw-timber trees which have reached or passed the age of physiological maturity.

Pole-timber trees: Trees 5.0 inches d.b.h. and larger of commercial species that do not meet the specifications for saw-timber trees but do meet regional specifications of species, soundness, and freedom from defect.

Potential timber volume under the Forest Program: The volume of live saw timber and growing stock on commercial forest land which would result 50 years from the inventory year if the Forest Program measures were fully applied during the entire period.

Salvable dead all-timber volume: Net volume in cubic feet of salvable dead saw-timber and pole-timber trees.

Salvable dead saw-timber volume: Net volume in board feet International 1/4-inch rule of salvable dead saw-timber trees.

Salvable dead trees: Standing or down dead trees which are considered merchantable by regional standards.

Sawlog portion: Net volume in cubic feet of saw-timber trees between stump and merchantable top.

Saw-timber trees: Trees of commercial species that contain at least one merchantable sawlog as defined by regional practice and which are of the following minimum diameters at breast height (d.b.h.):

East of 100th Meridian: Softwoods 9.0 inches and hardwoods 11.0 inches.

West of 100th Meridian: All species 11.0 inches.

Saw-timber volume: Net volume in board feet, International 1/4-inch rule, of live and salvable dead saw-timber trees to a merchantable top.

Grade factors	Log Grade 1		Log Grade 2	Log Grade 3
DIAMETER (minimum)	13" - 15"	16"-19"; 20" $\frac{1}{4}$	11	8" $\frac{1}{4}$
LENGTH (minimum)	10' $\frac{1}{4}$	10' $\frac{1}{4}$	8'-11'; 12' $\frac{1}{4}$	8' $\frac{1}{4}$
CLEAR CUTTINGS (on the 3 best faces)				
Length (minimum)	7'	5' : 3'	3'	2'
Number on face (maximum)	2	2	2 : 3	Unlimited
Yield in face length (minimum)	5/6	5/6	4/6	3/6
SWEEP AND CROOK DEDUCTION (maximum)	15%	15%	30%	50%
CULL DEDUCTION, including sweep (maximum) ..	40%	40%	50%	50%
SOUND END DEFECTS, area (maximum)	— See instructions (Laboratory Release No. D-1737-A)			

Exceptions. In ash and basswood 12" d.i.b. for grade 1 butts.

Grade 2, 10" d.i.b. must be grade 1 surface quality.

Grade 2, 11" d.i.b. limited to two cuttings.

Grade 2, 8' and 9' lengths limited to 12" d.i.b.; 3/4 yield in not more than 3' $\frac{1}{4}$ cuttings.

Sweep and crook allowance reduced 1/3 in logs with more than 1/4 diameter in sound end defects.

Sixty percent cull deduction permitted in grade 2 if otherwise of grade 1 quality.

Sixty percent cull deduction permitted in grade 3 if otherwise of grade 2 quality.

1/ Forest Products Laboratory, Madison, Wisconsin, March 10, 1949, "Hardwood Log Grades for Standard Lumber," No. DL737-A.

Volumes (cont'd)Log grades (continued)

Hardwood construction log specifications (Tie and timber logs)--Log Grade
No. 4 (includes the roughest log considered merchantable) 1/

Position in tree	Butt and upper
D.i.b., small end, inches	8 $\frac{1}{4}$
Length without trim, feet	8 $\frac{1}{4}$
Clear cuttings	No requirements. Not graded on cutting basis.
Sweep allowance, maximum	1/4 d.i.b. of small end for half logs and 1/2 d.i.b. for log 16' long.
Sound surface defects permitted:	
Single knots	Any number, if none has an average collar diameter in excess of 1/3 of log diameter at point of occurrence. ^{2/}
Whorled knots	Any number provided the sum of the collar diameters does not exceed 1/3 the log diameter at point of occurrence.
Holes	Any number not exceeding knot specifications if they do not extend over 3 inches into the contained tie or timber.
Unsound defects permitted:	
Surface	Any number and size if they do not extend into contained tie or timber. If they extend into contained tie and timber they shall not exceed size, number, and depth of limits of sound knots.
Interior	None permitted except one shake not more than 1/3 the width of contained tie or timber and one split not over 5 inches long.

1/ Interim Log Grades for Southern Hardwoods, 1948 (above grade called 3-B).

2/ Knot collar is the average of the vertical and horizontal diameters of the limb or knot swelling as measured flush with the surface of the log.

Local use logs that do not meet the minimum specifications of the above grades will not be considered merchantable for Survey purposes.

Volumes (cont'd)

Seedling and sapling trees: Trees of commercial species less than 5.0 inches in diameter at breast height.

Small young-growth saw-timber trees: Young-growth hardwood and softwood saw-timber trees less than 15.0 inches d.b.h. east of the 100th Meridian and less than 21.0 inches d.b.h. west of the 100th Meridian.

Upper stem portion: Net volume in cubic feet of bole of saw-timber trees between merchantable top and a point on the bole with a minimum top 4.0 inches in diameter inside bark when it exists.

Young-growth saw-timber trees: Saw-timber trees which have not reached the age of physiological maturity.

Growth

Net annual growth of saw timber: The change during a specified year in net board-foot volume of live saw timber on commercial forest land resulting from natural causes exclusive of catastrophic losses.

Net annual growth of growing stock: The change during a specified year in net cubic-foot volume of growing stock on commercial forest land resulting from natural causes exclusive of catastrophic losses.

Potential growth under the Forest Program: The net annual growth on commercial forest land which would be obtained 50 years from the inventory year if the Forest Program measures were fully applied during the entire period.

Mortality

Annual mortality of saw timber: The net board-foot volume removed from live saw timber during a specified year through death from natural causes.

Annual mortality of growing stock: The net cubic-foot volume removed from growing stock during a specified year through death from natural causes.

Annual timber mortality: The net volume removed from live saw timber or growing stock on commercial forest land during a specified year through death from natural causes, but not as the result of catastrophes.

Catastrophic growing stock mortality: Net cubic-foot volume removed from growing stock as a result of catastrophic mortality.

Catastrophic saw-timber mortality: Net board-foot volume removed from the live saw timber as a result of catastrophic mortality.

Catastrophic timber mortality: The net volume removed from live saw timber or from growing stock on commercial forest land during a specified period through death from natural causes of extreme severity.

Drain

Allowable cut: The volume of live saw timber and growing stock that can be cut during a given period while building up or maintaining sufficient growing stock to meet specified growth goals.

Commodity drain on live saw timber: The board-foot volume of live saw-timber trees removed from commercial forest land during a specified year as timber products and logging waste.

Commodity drain on growing stock: The cubic-foot volume of live saw-timber and pole-timber trees removed from commercial forest land during a specified year as timber products and logging waste.

Land clearing and cultural operations drain on live saw timber: The board-foot volume of live saw-timber trees removed from commercial forest land by land clearing and cultural operations during a specified year and not converted to timber products.

Land clearing and cultural operations drain on growing stock: The cubic-foot volume of live saw-timber and pole-timber trees removed from commercial forest land by land clearing and cultural operations during a specified year and not converted to timber products.

Logging waste of live saw timber: The board-foot volume of live saw-timber trees cut or killed by logging on commercial forest land and not converted to timber products.

Logging waste of growing stock: The cubic-foot volume of live saw-timber and pole-timber trees cut or killed by logging on commercial forest land and not converted to timber products.

Timber products output: The volume of timber products cut from both growing stock and other miscellaneous sources.

Timber products from miscellaneous sources: The volume of timber products cut from cull trees, limbs, dead trees, timber from noncommercial and non-forest land, and overutilization of growing stock.

Total annual drain on live saw timber: The board-foot volume of live saw-timber trees removed from commercial forest land during a specified year through commodity drain and land clearing and cultural operations.

Total annual drain on growing stock: The cubic-foot volume of live saw-timber and pole-timber trees removed from commercial forest land during a specified year through commodity drain and land clearing and cultural operations.

September, 1948

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics

CLEARANCE OF QUESTIONNAIRES
AND
REPORTING REQUIREMENTS

Purpose

The policy of Congress in adopting the Federal Reports Act of 1942 was stated to be "...that information which may be needed by the various Federal agencies should be obtained with a minimum burden upon business enterprises (especially small business enterprises) and other persons required to furnish such information, and at a minimum cost to the Government, that all unnecessary duplication of efforts in obtaining such information through the use of reports, questionnaires, and other such methods should be eliminated as rapidly as practicable; and that information collected and tabulated by any Federal agency should insofar as is expedient be tabulated in a manner to maximize the usefulness of the information to other Federal agencies and the public."

Machinery for Clearance

The Division of Statistical Standards of the Bureau of the Budget is responsible for administering the Federal Reports Act. To assist in carrying out the functions of the Act, most Federal agencies have established clearance offices which serve as liaison offices with the Division of Statistical Standards. In the Department of Agriculture, the Bureau of Agricultural Economics has been designated by the Secretary as the agency responsible for such clearance and there has been established in the Office of the Chief a clearance office for this purpose.

The first step in the clearance process usually involves clearance within one's own Bureau or Branch.^{1/} Most of the agencies within the Department have a designated official who is responsible for the clearance of questionnaires and reporting requirements originating from within his agency. After this approval has been obtained, requests for Department approval should be forwarded to the Office of the Chief, Bureau of Agricultural Economics, Attention: J. Richard Grant, Statistical Analyst. After clearance is completed within the Department, the requests are submitted to the Bureau of the Budget for final approval.

^{1/} The Forest Service clearance officer is Chief of the Division of Forest Economics.

What Needs to be Cleared

Paragraph 561, Section 10, Title I, of the Administrative Regulations of the Department states: "No agency of the Department shall collect or sponsor the collection of information, upon identical items, from ten or more persons (other than Federal employees considered as such) unless the plans and report forms to be used in such collection have been approved by the Chief of the Bureau of Agricultural Economics." Regulation A of the Bureau of the Budget includes a similar statement covering the procedure for clearance with the Division of Statistical Standards. It should be noted that the emphasis is upon both collection and sponsoring the collection of information, and upon the plans for collection of data, as well as the questionnaires, report forms, or other similar devices. It was intended to include the collection of data from the public, whether a schedule or some other device for getting information on identical items is involved. This includes reporting and record keeping requirements called for in Department regulations, contracts, and agreements.

The passage of the Research and Marketing Act has brought about a number of "border-line" problems as to what needs to be cleared, particularly on cooperative Federal-State projects. There is no set rule that will apply to all situations and in order to be on the safe side, project leaders or others collecting data from the public should refer all cases through their agency clearance office to the BAE clearance office for a decision.

In the case of projects sponsored entirely by the Department, there is, of course, no question. Such questionnaires require clearance under the same regulation governing clearance of questionnaires financed from regularly appropriated funds. In the case of cooperative projects involving the Department and other agencies, usually States, it is often not clear to project supervisors whether clearance of questionnaires to the public is required. In general, any cooperative questionnaires, for which Department officials have the responsibility for preparation, should be cleared. On the other hand, cooperative questionnaires prepared by State or non-Federal officials, with little or no assistance from Department officials, usually do not require formal Budget Bureau approval but should be submitted for a decision. Most cooperative questionnaires, however, are prepared jointly and fall between the two limits. It follows that the extent of Department sponsorship or participation is a primary factor in determining whether clearance of a particular questionnaire is necessary. Another factor to be considered is the area covered by a proposed project. If a cooperative survey is confined to one State or local area and pertains to subject matter of local interest only, it is usually possible to obtain waiver of Budget Bureau clearance. Even in these local questionnaires, however, there is a general interest in avoiding duplication of respondents contacted and subject matter covered.

Matters to be considered in Giving Approval

The Department Regulation specifies that the following shall be taken into account before approving a plan or report form:

1. That the proposed inquiry is justified, taking into account the burden on the respondents and the need for the collection of the information.
2. That the information will be utilized.
3. That the number of respondents, frequency of collection, number and difficulty of items and other requirements cannot well be reduced.
4. That adequate information is not already available in the Department or in other Government agencies.

The Regulation also specifies that proposed plans or forms shall be discussed with other agencies of the Department which may be concerned, prior to clearance.

What to Submit

In submitting a proposal for clearance, it is necessary that three copies of the schedule or form, along with instructions for its use, be submitted. Three completed copies of Standard Form 83, Request for Clearance, should accompany this material ^{1/}. In addition, it is necessary to have a brief statement of justification for the proposed collection of data, stating its central purpose and how it relates to research or action programs. For Research and Marketing Act projects, copies of the project statement will usually give this information.

It is also necessary to have a description of the sampling plan and, in those cases in which it is proposed to collect data from every potential respondent in the universe, a statement showing why sampling is not applicable. In some cases a statement on the number and qualifications of the staff which will do the interviewing will be useful.

It is essential to have a statement showing the objectives and specifications of the data and showing also how the various parts of the schedule are related to the objectives. Beyond this, it is necessary to have a statement showing how it is proposed to analyze the material. Where possible, this would include an outline of the final tables which are desired so that it would be possible to see how the various items on the schedule are proposed to be tabulated.

^{1/} Copy of Form 83 sent to Stations with Loveridge's circular of October 1, 1948 (RE-(O)-SUPERVISION, Questionnaire Clearance). This is prepared in Washington, but the originating field office should furnish the information necessary to complete the form.

This supplemental material need not be elaborate, but should be in sufficient detail to permit evaluation of the project as a whole in relation to its objectives. In this respect, the information that is required is simply the information which is available for any project which has been carefully thought through.

In cases in which a part or all of the information called for is already being collected by or is in the possession of some other government agency, the supplemental material should include a statement on why the additional information is required. In any case, a statement showing the steps taken to avoid duplication might save considerable time in clearance.

It is important that people in Washington, as well as in the field, recognize that this whole clearance procedure is a part of the planning of any survey designed to collect data from the public. Necessarily this process requires some time, and while we want to expedite it as much as possible, it is necessary that persons submitting projects from the field recognize that some time is required for this phase of the whole effort.

EXECUTIVE OFFICE OF THE PRESIDENT
Bureau of the Budget
Washington 25, D.C.

October 24, 1951

CIRCULAR NO. A-40
(Formerly Regulation A)
Revised

Clearance of Plans and Report Forms Under the Federal Reports Act

This revision of Circular No. A-40 replaces and rescinds Circular No. A-40, dated October 25, 1948, and Regulation A, originally issued on February 13, 1943. The Federal Reports Act of 1942 expressly applies to the collection of information not only when a Federal agency conducts the collecting but also when it sponsors the collecting (5 U.S. Code 139c). A new paragraph, 3b, has been added to the Circular to define the clearance responsibility assumed by the sponsoring agency whenever collection of information is undertaken as the result of Federal agency sponsorship. Changes have been made in the definition of the term "plan" (2e) and in the definition of "use" of a plan or report form (2k) to clarify application of this Circular to information obtained under Federal agency sponsorship. The definition of the term "respondent" (2j) has been revised to make explicit the inclusion of persons or organizations outside the United States.

1. Authority. This Circular is promulgated under the authority of sections 3(d), 5, and 6 of the Federal Reports Act of 1942, in order to provide for the review and clearance of plans and report forms used by Federal agencies in the collection of information.

2. Definitions.

- a. The term "Act" shall mean the Federal Reports Act of 1942. Section 5 of the Act reads as follows:

"No Federal agency shall conduct or sponsor the collection of information upon identical items, from ten or more persons (other than Federal employees considered as such) unless, in advance of adoption or revision of any plans or forms to be used in such collection,

"(a) The agency shall have submitted to the Director such plans or forms, together with copies of such pertinent regulations and other related materials as the Director shall specify; and

"(b) The Director shall have stated that he does not disapprove the proposed collection of information."

- b. The term "Federal agency" shall mean any executive department, commission, independent establishment, corporation owned or controlled by the United States, board, bureau, division, service, office, authority, or administration in the executive branch of the Government, provided, that it does not include the government of the District of Columbia or of any territory or possession of the United States, or any subdivision of such a government; the General Accounting Office; the Bureau of Internal Revenue, the Comptroller of the Currency, the Bureau of the Public Debt, the Bureau of Accounts, or the Division of Foreign Funds Control of the Treasury Department; or any Federal bank supervisory agency to the extent that such agency obtains reports and information from banks as provided or authorized by law and in the proper performance of its supervisory functions.
- c. The term "Director" shall mean the Director of the Bureau of the Budget. The term "Assistant Director" shall mean the Assistant Director of the Bureau of the Budget for Statistical Standards or his designated representative.
- d. The term "report form" shall mean or include any application form or other administrative report form, questionnaire, telegraphic request, or other similar device for the collection of information
- e. The term "plan" shall mean or include:

- (1) Any general or specific requirement for the establishment or maintenance of records (including systems of accounts and systems of classification) which are to be used or be available for use in the collection of information.
 - (2) Any requirement or instruction affecting the content, preparation, return, or use of a plan or report form.
 - (3) Any contract or agreement which will result in the collection of information on identical items by or for the contractor from ten or more respondents.
- f. The term "requirement" shall be deemed to include a recommendation, order, regulation, or other directive, but shall not apply to a general directive (in an order or regulation) which imposes a general duty to maintain such records or submit such reports as may thereafter or otherwise be specifically prescribed by appropriate authority. Such general directives shall, however, state that specific recording or reporting requirements subsequently prescribed will be "subject to the approval of the Bureau of the Budget pursuant to the Federal Reports Act of 1942."
- g. The term "information" shall mean facts or opinions obtained or made available by the use of a plan or report form.
- h. "Clearance" of a plan or report form shall mean and include (1) a determination that the information to be sought or provided thereby is reasonably needed by the Federal agency concerned, in the proper performance of its functions or otherwise, and (2) authorization to use the plan or report form in the collection or recording of such information in the manner proposed, or on such other conditions as the Assistant Director may prescribe, with an approval number, notation, or other appropriate device inscribed or endorsed thereon to indicate clearance, as herein prescribed. Such clearance shall constitute a declaration by the Director, in accordance with section 5 of the Act, that he does not disapprove the collection of information in the manner proposed. A withholding of clearance shall constitute among other things a determination in pursuance of section 3(d) of the Act that the collection of information in the manner proposed is unnecessary.
- i. The term "person" shall mean any individual, partnership, association, corporation, business trust, or legal representative, any organized group of persons, any State or territorial government or branch thereof, any political subdivision of any State or territory, or any branch of any such political subdivision.
- j. The term "respondent" shall mean any person or any agency or employee or instrumentality of the Federal Government, from which information is obtained or requested on a plan or report form. The term applies irrespective of whether the individual or organization is located within or outside the United States.

- k. Any plan or report form shall be deemed to be "used" by an agency when its use is wholly or partly sponsored, controlled, or contracted for by the agency. Among the types of sponsorship which are covered are situations in which the plan or report form is developed or put into use at the request of, order of, by virtue of a research grant from, or under contract with, a Federal agency. A Federal agency shall be regarded equally as sponsor with regard to work done by contractors and with regard to work done by subcontractors.
1. "Unnecessary duplication" shall be deemed to exist in the collection of information if the duplicating activities involve either identical information or information adequately similar for satisfactory use.
3. Clearance requirements.
- a. General requirements of clearance. No plan or report form (as herein limited or described) shall be used or prescribed by a Federal agency in the collection or recording of information without first obtaining clearance thereof from the Assistant Director and inscribing or endorsing thereon, to indicate such clearance, an approval number, notation, or other appropriate device, as herein prescribed. Sections 3, 4, 5 and 6 of this Circular shall apply only to (1) plans and report forms which require or call for information of an identical nature (or the recording thereof) from ten or more persons other than Federal employees considered as such, and (2) report forms which call for information of an identical nature from agencies, employees, or instrumentalities of the Federal Government, which is to be used for statistical compilations of general public interest, including compilations showing the status or implementation of Federal activities and programs.
- b. Responsibility of agency sponsoring collections of information. Whenever a Federal agency sponsors the use of a plan or report form by research grantees, contractors, and other sponsored collectors of information, including sponsoring a request for data to be obtained by others, it shall be the agency's duty--
- (1) To inform the sponsored collector of information of the requirements of this Circular;
 - (2) To insure that the submittal required by section 4a of this Circular is made; and
 - (3) To insure that the plan or report form is not used without clearance.
- c. Evidence of clearance for report forms. Clearance of a report form shall be evidenced or indicated by printing or inscribing on each copy so used, in the upper right-hand corner of the first page, an approval number assigned to it by the Assistant Director, in the following manner:

- (1) When no time limit is assigned to the use of the report form, the following style shall be employed:

Form Approved
Budget Bureau No. OO-R00

- (2) When a time limit is assigned to the use of the report form, the following style shall be employed, unless the Assistant Director specifies otherwise:

Budget Bureau No. OO-R00
Approval Expires (date)

- d. Evidence of clearance for plans. Clearance of plans for use in the collection or recording of information shall be evidenced by printing or inscribing on each plan so used one of the following endoresments or such other device as may be required by the Assistant Director:
 - (1) "The...(record-keeping, reporting, or other requirements) of this...(regulation or the like) have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942."
 - (2) "This...(record-keeping, reporting, or other requirement) has been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942."
- e. Termination of clearance and use. No plan or report form subject to section 3a shall be used after its expiration date without re-submittal and further clearance prior thereto. Moreover, clearance of any plan or report form subject to section 3a may be withdrawn by the Assistant Director, in which event the use of the plan or report form shall be discontinued at that time.
4. Request for clearance for new plans and report forms.
 - a. Submittal for clearance. In order to obtain review and clearance, the agency shall submit two copies of the plan or report form to the Assistant Director in time to allow for adequate review and the adoption of any necessary alterations (including coordination or integration with other plans and report forms) without delaying the operating program to which the plan or report form relates. Such submittal shall be accompanied by Standard Form No. 83, appropriately filled out, and such other data as the Assistant Director shall require. Ordinarily, the submittal will not need to be accompanied by a letter, as Standard Form No. 83 is itself a request for clearance. A copy of Standard Form No. 83 is attached to this Circular, and a supply of this form for agency use may be purchased from the Government Printing Office.

- b. Other material to be submitted. In addition to the foregoing, there shall be submitted for examination or clearance such other material pertaining to the collection, processing, tabulation, analysis, or publication of information as may from time to time be required by the Assistant Director.
- c. Consideration of practical utility. To minimize the reporting burden on respondents, especially individuals and small business enterprises, and to improve governmental efficiency, each Federal agency shall consider and determine, in connection with each plan or report form submitted, whether the proposed plan or report form exceeds the limits of reasonable need or practical utility, either with respect to number of respondents, frequency of collection, number and difficulty of the items, or otherwise, and whether all of the items of information to be furnished or recorded are essential to the central purpose of such plan or report form. Clearance of plans and report forms submitted will be withheld whenever it appears to the Assistant Director that this requirement has not been met.

5. Request for clearance for revised plans and report forms. Before a material revision or change shall be made in a plan or report form for which clearance is required, or in the use thereof, further clearance shall be obtained from the Bureau of the Budget in the manner prescribed in this Circular, by submitting pertinent data or explanation in relation thereto on Standard Form No. 83. A material revision or change in a plan or report form or the use thereof, necessitating further clearance, shall ~~mean~~ include any significant revision in (1) the kind or amount of information sought, (2) the number or identity of respondents, or (3) the time or frequency of reporting. It shall also include a transfer of the duty or function of collecting, processing, or tabulating the information, either into, or out of, or within a Federal agency.

6. Request for extension of clearance. If use of a plan or report form beyond a scheduled expiration date is desired, without material revision or change, the request for an extension of clearance shall be made on Standard Form No. 83, or by letter, or as otherwise determined by the Assistant Director.

7. Use of exempt forms.

- a. Granting of exemptions. Exemption from clearance may be granted by the Assistant Director with respect to affidavits, oaths, certifications, and other plans and report forms which do not call for information of substantial volume or importance.
- b. Advisory review. Any form or reporting requirement for which clearance is not required by this Circular may be submitted to the Assistant Director for advisory review and, when desired, assignment of an approval number or other clearance device, as described in section 3, in order to facilitate the use thereof. This provision refers to:

- (1) Plans and report forms used by an agency that is not subject to this Circular, and those which are used in the collection (or recording) of information from fewer than ten persons or in other circumstances not covered by section 3a.
- (2) Forms and reporting requirements other than those herein defined as report forms and plans.

c. Notation on exempt forms. In order otherwise to facilitate compliance with forms and reporting requirements for which clearance is not required by this Circular and has not been obtained under the preceding paragraph, or with respect to which exemption may have been granted by the Assistant Director, and otherwise to minimize uncertainty and misunderstanding in connection with the use thereof, the following notation may be used thereon by the agency concerned, preferably in the upper right-hand corner of the first page:

Approval of Budget Bureau
not required

d. Termination of exemption. The use of the foregoing notation shall be discontinued, and an approval number or other appropriate clearance device shall be required in its place, whenever it shall be determined by the Assistant Director (in the absence of an authoritative ruling to the contrary) that the plan, report form, or other request for data is within the purview of section 3a of this Circular.

8. Deviation from terms of clearance. No deviation shall be made in the use of any plan or report form, or any clearance device, from the terms and conditions on which clearance shall have been granted hereunder.

9. Notice of discontinuance. Whenever the use of a plan or report form to which an approval number has been assigned is discontinued, except by expiration of a time limit fixed in pursuance of section 3c, the Assistant Director shall be notified by the responsible agency.

10. Records and reports. Each Federal agency shall afford the Assistant Director access to its records concerning the status and use of each plan or report form, and shall make such improvements in the records and such reports therefrom as the Assistant Director shall prescribe.

11. Exercise of authority.

a. Delegation of Director's authority. The authority conferred by the Act on the Director may be exercised by the Assistant Director to the extent necessary or appropriate for the performance of any function or duty prescribed by this Circular.

- b. Determination of scope. The determination of the Assistant Director as to whether any plan, report form, activity, or other matter is within the scope of the Act or this Circular shall be controlling.
- c. Waivers. Any provision of this Circular may be waived in writing by the Assistant Director.

12. Relation to existing authority. This Circular shall not be deemed to limit or preclude exercise of the authority vested in the Bureau of the Budget by Executive Order 8248, Executive Order 10033, Executive Order 10253, or otherwise, ~~to~~ to plan and promote the improvement, development, and coordination of Federal and other statistical services. The provisions of Budget Circular No. A-2 shall not apply to the collection, processing, analysis, or publication of information as herein defined.

FREDERICK J. LAWTON
Director

Attachment

Stations should refer also to Bureau of Budget Circular No. A-46, dated March 28, 1952, entitled "Standards for Statistical Surveys," transmitted by circular letter RE(O), Supervision, Standards for Statistical Survey, dated May 20, 1952.

APPENDIX C: STANDARDS FOR PUBLICATION OF STATISTICAL DATA

EXECUTIVE OFFICE OF THE PRESIDENT
Bureau of the Budget
Washington 25, D. C.

June 23, 1947

Mr. Lyle F. Watts
Chief
Forest Service
Department of Agriculture
Washington 25, D. C.

My dear Mr. Watts:

I am enclosing a statement of "Standards for the Publication of Statistical Data." This statement is being issued to each agency which publishes statistical data, for voluntary adoption and enforcement.

The statement has been prepared by the Division of Statistical Standards and the Federal Committee on Economic Statistics to aid in maintaining and strengthening safeguards governing the presentation of statistical data. We believe that the closest possible adherence to these basic standards and procedures will reduce to a minimum the areas for possible misunderstanding or misinterpretation of the Government's statistical data.

In the preparation of the statement we have not sought to establish new standards or procedures, but to codify what is generally regarded as good statistical practice. About 30 agencies of the Federal Government have contributed during the past nine months toward the framing of these standards. Consequently, I believe that the statement as it stands is practicable, can be further adapted to particular requirements of various agencies, and can be of positive value in improving the usefulness of Government statistics for all groups.

Will you please call this statement to the attention of appropriate individuals within your organization. We shall be glad to supply whatever number of additional copies you may desire.

Sincerely yours,

/s/ Stuart A. Rice

Stuart A. Rice
Assistant Director in Charge
of Statistical Standards

Enclosure

EXECUTIVE OFFICE OF THE PRESIDENT
BUREAU OF THE BUDGET
Division of Statistical Standards

Standards for the Publication of Statistical Data

The growing use of Government statistics in the determination and appraisal of public and private policies emphasizes the responsibility of Government statistical agencies to maintain and strengthen safeguards governing the publication, as well as the compilation, of statistical data. Full information concerning the methods employed in compiling figures and the limitations to which the figures are subject should be available to users of Government statistics. It must also be recognized that many users of Government statistics, particularly those who use the data infrequently, are not familiar with the basic characteristics of the data. Therefore statistical data should be labeled or described clearly and accurately, and every reasonable precaution should be taken to guard against misunderstanding.

Procedures to reduce the areas of possible misunderstanding or misinterpretation of the Government's statistical data are presented below. The list has been developed by the Division of Statistical Standards and the Federal Committee on Economic Statistics, and represents a codification of what is regarded as good statistical practice within and outside the Government. Because the standards and procedures must be applied to many kinds of data and to various types of publications, to single-time reports as well as to historical series, they are necessarily broad in scope and general in character, and particular standards may not be applicable in every case.

The points covered in the following list refer to the presentation of statistical data, and not to the content of agency programs. It should be emphasized, however, that each agency should periodically reexamine the content of its statistical program in the light of current developments and needs, taking into account criticisms and suggestions received from other agencies and from interested nongovernmental groups.

1. Every release or publication of statistical data, whether recurring or single-time, should clearly indicate the nature of the data and make reference to any detailed technical descriptions available. When an established series is revised, the character of the revision and its effect upon the series should be explained. Descriptions of new and revised series when first issued should include more detailed information on methods of compilation and on qualifications as to use than need to be presented regularly.

2. For periodic reports of all but simple data and for one-time reports where applicable, there should be available a reasonably detailed statement containing the information essential to a competent technical appraisal of the data. The technical statement should make it possible to judge the appropriateness of the data for any intended use, and should cover such items as:

- Definition of what is measured
- Type of respondent
- Method of collection
- Methods of processing and adjustment
- Benchmarks
- Indications of reliability and accuracy where these can be satisfactorily measured
- Warnings of known limitations
- Changes in definitions, sample, coverage, schedule or processing
- Appraisal of homogeneity and comparability of component parts derived from sources outside the agency
- Comparison and contrast with statistics of similar title or scope with which the data might be confused.

3. When published statistics are derived from a sample survey, there should be available a detailed description of the sampling plan. The description may appear either in the published report or in a technical statement, available to the public, to which the report refers, and should cover:

- Sampling plan and type of solicitation
- Size of sample and proportion of coverage
- Percentage of response and treatment of nonresponse
- Weighting procedures and method of estimating the universe from the sample
- Where possible, estimates of the sampling error and other measurements of the accuracy of the data.

4. There should be within the agency established procedures and sets of instructions governing the processing of the data, and provision for periodic reexamination of the procedures and instructions. Information regarding the procedures and instructions should be available to technicians outside the agency.
5. Before publication, the final compilations should be reviewed within the agency by persons familiar with the data and with related data in the same field, for the purpose of disclosing errors or inadequacies

Appendix C

in the procedures followed and of discovering any likely source of misinterpretation. Any explanations indicated as necessary by such review should be made in the report.

6. Every press release which presents statistical data should be checked with qualified technicians within the agency for final review before release to make sure that the data are properly used and interpreted.
7. Any published description of data compiled by another agency should be checked by the agency which compiled the data.
8. In the preparation of analytical or interpretive reports, any special uses of data compiled by another agency should be reviewed with that agency to ensure that the use is based on proper understanding of the data.
9. In economic analyses, there should be a clear distinction between the actual data and inferences and interpretations made from the data, the sources of data used in the analyses should be indicated, and adjustments of the data identified and described to the extent practicable.
10. Forecasts and projections should be clearly labeled as such and distinguished from historical series, and where feasible the conditions and assumptions explained.
11. Analytical or interpretive reports should contain an explanation of any differences in assumptions or methods which give rise to apparent contradictions or discrepancies with reports issued by other agencies.

(June 16, 1947)

APPENDIX D - STANDARD TABLES
(see section 4.1)

Table 1.--Land area, by major classes of land, State, 19

Class of land	:	Area
	:	<u>Thousand acres</u>
Forest:	:	
Commercial	:	
Noncommercial:	:	
Reserved from commercial timber use	:	
Unproductive for timber use ^{1/}	:	
Total	:	
Nonforest ^{2/}	:	
Total, all classes	:	

^{1/} Includes acres withdrawn for special uses.

^{2/} Includes acres of water according to Survey standards of area classification but defined by the Bureau of Census as land.

Table 2.--Commercial forest land area, by ownership and stand-size classes, State, 19

Ownership class	Total	Saw-timber stands	Pole-timber stands	Seedling and sapling stands	Nonstocked and other areas ^{1/}
	Thousand acres	Thousand acres	Thousand acres	Thousand acres	Thousand acres
Federally owned or managed:					
National forest					
Indian					
Other					
Total					
State					
County and municipal					
Private					
All ownerships					

^{1/} Includes areas not classified elsewhere.

Table 3.--Area of commercial forest land,
by major forest types,
State, 19

Forest type	Thousand acres
Use types	
listed	
under	
Forest types	
Appendix A	
Total	

Table 4.--Net volume of live saw timber and growing stock on
commercial forest land, by stand-size class, State, 19

Stand-size class	:	Saw timber	:	Growing stock
	:	<u>Million bd. ft.</u>	:	<u>Million cu. ft.</u>
Saw-timber stands	:		:	
	:		:	
Pole-timber stands	:		:	
	:		:	
Seedling and sapling stands	:		:	
	:		:	
Nonstocked and other areas not elsewhere classified	:		:	
	:		:	
	:		:	
Total	:		:	

Table 5.—Net volume of live saw timber and growing stock on commercial forest land, by ownership class, State, 19

Ownership class	Saw timber	Growing stock
	<u>Million bd. ft.</u>	<u>Million cu. ft.</u>
Federally owned or managed:		
National Forest		
Indian		
Other		
Total		
State		
County and municipal		
Private:		
Farm		
Industrial and other		
Total		
All ownerships		

commercial forest land, by species, State, 19

Species	Saw timber	Growing stock
	<u>Million bd. ft.</u>	<u>Million cu. ft.</u>
Softwoods:		
(use species list in 2.31113)		
Total		
Hardwoods:		
(use species list in 2.31113)		
Total		
All species		

Table 7.--Net volume of live saw timber on commercial forest land,
by diameter class groups and species, State, 19

Species	Diameter class groups (Use diameter classes specified in 2.31115)	Total
	Million bd. ft.	
(Use		
species		
list		
in		
2.31115)		

Table 8.--Net volume of all timber on commercial forest land, by class of material and species group, State, 19

Class of material	Total	Softwoods	Hardwoods
	Million	Million	Million
	cubic ft.	cubic ft.	cubic ft.
Growing stock:			
Saw-timber trees:			
Sawlog portion			
Upper stem portion			
Total			
Pole-timber trees			
Total growing stock			
Other material:			
Sound cull trees			
Rotten cull trees			
Hardwood limbs			
Salvable dead trees			
Total other material			
Total, all timber			

Table 9.--Net annual growth, annual mortality, and commodity drain on live saw timber and growing stock on commercial forest land, by species groups, State, 19

Item	Saw timber			Growing stock		
	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods
	<u>Million board feet</u>			<u>Million cubic feet</u>		
Net annual growth						
Annual mortality						
Commodity drain						
Timber products						
Logging waste						
Total ^{1/}						

^{1/} Add where applicable: Includes and cultural operations.

drain from land clearing

Table 10.--Total output of timber products and commodity drain on live saw timber and growing stock, State, 19

Product	Volume			Commodity			Commodity		
	of products cut ^{1/}			drain on saw timber			drain on growing stock		
	Standard:	M		Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods
	unit	Number	cu.ft.						
					Million bd.ft.			Million cu.ft.	
Sawlogs	M bd.								
	ft. ^{2/}								
Veneer logs and bolts	"								
Cooperage logs and bolts	"								
Pulpwood logs	"								
Pulpwood bolts	Std.								
	cords ^{3/}								
Fuel wood	"								
Piling	M linear								
	feet								
Poles	M pieces								
Posts	"								
Hewn ties	"								
Mine timbers	M cu.ft.								
Miscellaneous ^{4/}	"								
Total	xxx	xxx							

1/ Includes material from both growing stock and other miscellaneous sources.

2/ International 1/4-inch rule.

3/ Rough wood basis.

4/ Includes chemical wood, excelsior, handle stock, shingle bolts, etc.

Table 11.--Net volume of live saw timber and growing stock
required to sustain the 19 level of drain
by species groups. State.

Species group	:	Saw timber	:	Growing stock
	:	<u>Million board feet</u>	:	<u>Million cubic feet</u>
Softwoods	:		:	
Hardwoods	:		:	
Total	:		:	

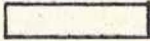
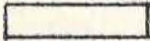
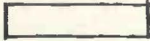
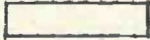
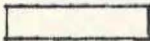
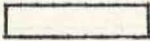
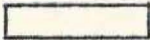

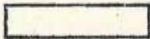

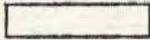
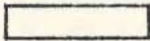
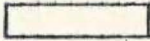
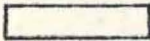
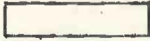
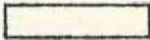
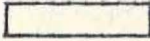
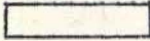
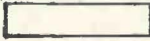
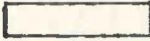
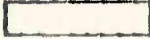

Note: Do not publish without approval of Chief's office (see 4.1).

Table 12.--Potential timber volume and growth on
commercial forest land under the
Forest Program, State.

Class of material	:	Potential net	:	Potential volume
	:	annual growth	:	
Saw timber	:	_____ million bd. ft.	:	_____ million bd. ft.
Growing stock	:	_____ million cu. ft.	:	_____ million cu. ft.

Note: Do not publish without approval of Chief's office (see 4.1).

APPENDIX E: COLOR LEGEND FOR GENERALIZED FOREST TYPE MAP

<u>Type No.</u>	<u>GP 1/</u>	<u>Crayon No. 2/</u>	<u>Color</u>	<u>Major Types</u>
<u>Western Types</u>				
1	142	325		Douglas-fir
2	144	354		Hemlock-Sitka spruce
3	119	321		Redwood
4	132	353 $\frac{1}{2}$		Ponderosa pine
5	134	351 $\frac{1}{2}$		White pine
6	172	351		Lodgepole pine
7	147	356		Larch
8	148	354 $\frac{1}{2}$		Fir-spruce
9	181	324 $\frac{1}{2}$		Pinyon pine-juniper
10	194	320 $\frac{1}{2}$		Hardwoods
<u>Eastern Types</u>				
11	173	343		White-red-jack pine
12	189	331 $\frac{1}{2}$		Spruce-fir
13	121	349		Longleaf-slash pine
14	133	353 $\frac{1}{2}$		Loblolly-shortleaf pine
15	171	324		Oak-pine
16	145	356		Oak-hickory
17	143	325		Oak-gum-cypress
18	153	320		Elm-ash-cottonwood
19	141	354 $\frac{1}{2}$		Maple-beech-birch
20	152	350		Aspen-birch
21	185	352 $\frac{1}{2}$		Unproductive for timber use
22	--	--		Reserved from commercial timber use (Hatch in black over type color)

1/ GPO - Standard ink sample book, 1950

2/ From Dixon "Best" Colored Pencils, Assortment No. 110.

FOREST SURVEY PROGRESS REPORT 1/

Station _____

Date - July 1, 1946
to

Section I. - Cumulative Progress

State	: Estimated:	Total funds spent	: Proportion:	Acreage	Cost per acre		Total forest area			
	: total :	July 1, 1946 to date	: of total :	equiva-	Forest	Total	covered in field by inventory			
	: forest :		: job done :	lent	Survey			Non-		
	: area :	: Contributions:			funds		Commercial:	commercial:	Reserved	
	: 2/ :	: Forest Survey: 3/ :	: 4/ :	: 5/ :	: 6/ :	: 7/ :				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	M Acres	Dollars	Dollars	Percent	M Acres	Cents	Cents	M Acres	M Acres	M Acres

1/ Use a separate sheet for each state and furnish a letter-size map with county boundaries delineating by coloring or hatching the area covered by inventory during each report period; the total area of such coloring or hatching should agree with columns 9, 10, and 11 added together. Where there are both initial and maintenance surveys in the same state, report separately. Make figures cumulative from July 1, 1946 to date of each report. Submit tabulation and map in triplicate semi-annually covering periods January 1 through June 30, and July 1 through December 31, to reach Washington August 1 and January 1, respectively.

In addition to cumulative reports on past progress, submit tabulation and map in triplicate annually to reach Washington August 1, forecasting cumulative progress from July 1, 1946 to the end of the fiscal year just starting.

2/ Include commercial, noncommercial and reserved forest land. Indicate acreages of each: Commercial _____, noncommercial _____, reserved _____, total _____.

3/ Show total dollar value of all contributions.

Includes all phases of the Survey. Figure is weighted according to each Station's estimate shown in Section II below.

5/ Column 5 times column 2.

6/ Column 3 divided by column 6.

7/ Sum of columns 3 and 4 divided by column 6.

8/ Total area covered by inventory including area, volume, growth, and mortality. This should agree with the accompanying map.

Section II. - Cumulative Work Table for Computing Proportion of Total Job Done (Column 5 above)

	:	Estimate of	:		:	
Survey phase	:	total job lead	:	Percent of	:	Weighted
	:	in percent	:	job done	:	percent

A. Inventory

Field

Office

B. Drain

Field

Office

C. Requirements

D. Reports

Section III. Dollar Value of Contributions by Kind and Source. 1/

Item	Federal <u>2/</u> <u>3/</u>	Other public <u>3/</u>	Private
	Dollars	Dollars	Dollars

Aerial photos

Printing

Manpower

Cash

Other (specify) _____

1/ Contributions report is not cumulative. It should cover only six-month period since last progress report, or in the case of advance reports expected cooperation during fiscal year ahead. Add also a narrative description of cooperative help on reverse of sheet.

2/ Include all Federal contributions except Forest Survey funds.

3/ Specify agencies by footnote.